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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

AGDA-A (M) (19 Jul 71)

FOR OT-UT-71X010

26 July 1971

SUBJECT: Combat After Action Report - Airmobile Operations in Support
of Operation LAMSON 719 (101st Airborne Division) (U).
February 1971 thru 6 April 1971 (U)

SEE DISTRIBUTION

- AD 516603
1. The attached report is forwarded for review and evaluation in accordance with para 4b, AR 525-15.
2. The information contained in this report is provided to insure that lessons learned during current operations are used to the benefit of future operations and may be adapted for use in developing training material.
3. Information of actions initiated as a result of your evaluation should be forwarded to the Assistant Chief of Staff for Force Development, ATTN: FOR OT UT within 90 days of receipt of this letter.
- 11 May 71
346

BY ORDER OF THE SECRETARY OF THE ARMY:

1 Incl
Report (2 Vols)

Verne L. Bowers
VERNE L. BOWERS
Major General, USA
The Adjutant General

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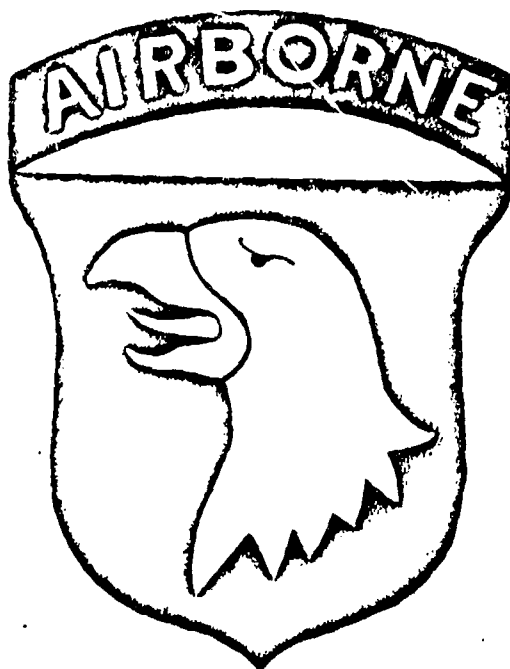
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3

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101ST AIRBORNE DIVISION (AIRMOBILE)



FINAL REPORT

AIRMOBILE OPERATIONS IN SUPPORT OF
OPERATION LAMSON 719
8 February - 6 April 1971

VOLUME I

1 May 1971
Camp Eagle
Republic of Vietnam

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HEADQUARTERS 101ST AIRBORNE DIVISION (AIRMOBILE)
Office of the Assistant Division Commander
APO 96383

AVDG-AC

24 April 1971

**SUBJECT: Final Report-Airmobile Operations in Support of Operation
LAMSON 719**

Commanding General
101st Airborne Division (Airmobile)
APO 96383

1. In compliance with Letter, AVDG-GC, Headquarters, 101st Airborne Division (Airmobile), 25 February 1971, subject: Letter of Instructions, Airmobile Operations Study Group (Inclosure 1), the final report is forwarded for review and approval.
2. This report records and analyzes the history of airmobile operations conducted by the 101st Airborne Division (Airmobile), and those units under its operational control, in support of the Republic of Vietnam Armed Forces during LAMSON 719. The bases of the analysis contained in this report are official records and journals, personal experiences and opinions of those directly involved in the operation on a daily basis, and professional seminars conducted during the operation. The principal focus of this report is on US Army aviation support to RVNAF during their operations in Laos. The report covers the period 8 February 1971, date of the initial airmobile combat assaults into Laos, through 6 April 1971, the date of the concluding airmobile raid into Laos. Major emphasis is placed on the period 8 February to 24 March, the date of the withdrawal of RVNAF forces from Laos.
3. The Final Report-Airmobile Operations in Support of Operation LAMSON 719 is presented in two volumes. Volume I, the decision maker's volume, summarizes salient points and observations concerning airmobile operations in support of LAMSON 719. Volume II, the staff officer's volume, contains detailed records, facts, and commanders' observations as appropriate.

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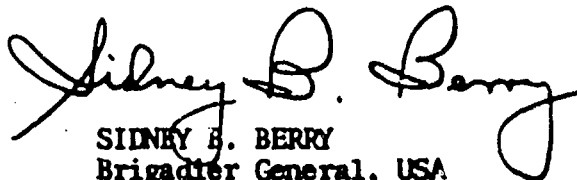
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AVDG-AC

24 April 1971

SUBJECT: Final Report-Airmobile Operations in Support of Operation
LAMSON 719.

4. Names and positions of members of the Steering Committee, Working Group, and participants in the work of the Airmobile Operations Study Group are at Inclosure 2.



SIDNEY B. BERRY
Brigadier General, USA
Assistant Division Commander

2 Incl
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HEADQUARTERS 101ST AIRBORNE DIVISION (AIRMOBILE)
Office of the Commanding General
APO 96383

AVDG-CG

25 February 1971

SUBJECT: Letter of Instructions, Airmobile Operations Study Group

SEE DISTRIBUTION

1. Purpose: a. To establish and Airmobile Operations Study Group and provide terms of references for the study of airmobile operations in support of Operation LAMSON 719.

b. This study will record the history of the airmobile aspects of LAMSON 719 and derive lessons and guidelines to improve current and future airmobile operations, organization, and doctrine.

2. General: a. Operation LAMSON 719 is an Allied operation against NVA forces, base areas, and lines of communication in that part of Laos adjacent to the two northern provinces of RVN. GVN ground forces operate in Laos under command of I Corps, ARVN. US aviation and airmobile forces support GVN operations in Laos under command of XXIV Corps, but no US ground units participate.

b. "Mid-intensity conflict" best describes the level of combat and operational environment being experienced in LAMSON 719 by GVN forces and supporting US aviation and airmobile forces. This level of conflict contrasts with the low-intensity level of conflict which characterizes other combat in the various phases of the Indo-China war.

Inclosure 1 to Ltr: Final Report

AVDG-CG

25 February 1971

SUBJECT: Letter of Instruction, Airmobile Operations Study Group

c. In Operation LAMSON 719, allied forces conduct ground and airmobile assaults against long established, well developed, heavily defended NVA base areas and lines of communication. Battalion, regiments and divisions oppose like units. Soviet weapons oppose US weapons. Both sides are equipped with armor. Modern sophisticated antiaircraft weapons in large numbers are pitted against attack aircraft and airlift operations.

d. The special command and operational arrangements resulting from the parallel Allied command organization and the restricted US presence across the Laotian border make LAMSON 719 a special case and perhaps, unique operation. Despite these peculiarities, there are lessons to be learned from this experience that are important to the future of worldwide airmobile operations, particularly in a "mid-intensity" conflict.

e. It is essential, therefore, that the experience and techniques of airmobile operations developed during LAMSON 719 be recorded, collected, analyzed, and searched for lessons applicable to current and future airmobile operations.

3. Scope: a. The scope of the study will include collection and collation of data to include personal experience and opinion, as well as official records, journals, and documents; analysis of current airmobile operations, organization, and doctrine to find ways of improvement and to discover lessons, guidelines and lines of inquiry useful for the future of airmobility.

b. The study will include inquiry into the following areas. This list is not all-inclusive.

- (1) Relationship between ground tactical plan and airmobile operations.
- (2) Command control.
- (3) Target acquisition.

9

AVDG-CG

25 February 1971

SUBJECT: Letter of Instruction, Airmobile Operations Study Group

- (4) Techniques of target engagement.
- (5) Fire support planning, coordination, and employment.
- (6) Maintenance.
- (7) Logistical support.
- (8) Aviation safety.
- (9) Organization of airmobile units.
- (10) Airmobile equipment, particularly aircraft and armament.
- (11) Airmobile doctrine.
- (12) Special considerations of Allied airmobile operations.

4. Organization: a. The Airmobile Operations Study Group will be comprised of selected commanders and staff officers who have participated in the airmobile operations in support of LAMSON 719. The Committee will meet periodically to provide guidelines to the Working Group who will conduct and draft the study. The Chairman of the Steering Committee will be the Assistant Division Commander (Operations). The membership of the Steering Committee is attached as Inclosure 1.

c. The Working Group will consist of a small group of officers specially selected for full-time assignment to the study group. The Working Group will accumulate and analyze data and draft the study itself. They will be responsive to the guidance provided by the Steering Committee through its Chairman, The Assistant Division Commander (Operations) and the Assistant Chief of Staff, G3, as the Chairman's executive agent. The membership of the Working Group will be determined at the first meeting of the Steering Committee.

5. Reports: Periodic progress reports will be submitted as approp-

AVDG-CG

25 February 1971

10

SUBJECT: Letter of Instructions, Airmobile Operations Study Group

riate to the Commanding General, 101st Airborne Division (Airmobile), as will recommendations for improvement of current airmobile operations, organization or doctrine. The final report of the Study Group will be submitted to the Commanding General for use as he determines.

6. Schedule: The schedule of establishment and work of the Study Group is attached as Inclosure 2.

2 Incl
as


THOMAS M. TARPLEY
Major General, USA
Commanding

DISTRIBUTION:

- 1-Assistant Division Commander (Operations)
- 1-Assistant Division Commander (Support)
- 1-CO, 101st Aviation Group
- 1-CO, 101st Airborne Division Artillery
- 1-CO, 101st Airborne Division Support Command
- 1-CO, 2d Squadron, 17th Cavalry
- 1-CO, 4th Battalion, 77th Artillery
- 1-CO, 326th Engineer Battalion
- 1-CO, 5th Transportation Battalion
- 1-Assistant Chief of Staff, G3
- 10- Chief of Staff

//

Steering Committee, Airmobile Operations Study Group

Chairman: Assistant Division Commander (Operations)

Members:

1. Assistant Division Commander (Support)
2. CO, 101st Aviation Group
3. CO, 101st Airborne Division Artillery
4. CO, 101st Airborne Division Support Command
5. CO, 2d Squadron, 17th Cavalry
6. CO, 4th Battalion, 77th Artillery
7. CO, 326th Engineer Battalion
8. CO, 5th Transportation Battalion
9. Assistant Chief of Staff, G3

Inclosure 1 to Ltr of Instructions

Work Schedule, Airmobile Operations Study Group

/2

25 February 71	Terms of reference approved by Commanding General Steering Committee Meeting.
26 February 71	Working Group formed.
1 March 71	Director of Working Group submits study outline and work schedule to Chairman, Steering Committee.
3 March 71	Steering Committee Meeting.
14 March 71	1st Draft of Study to Steering Committee
15 March 71	Steering Committee Meeting.
19 March 71	2d Draft of Study to Steering Committee.
20 March 71	Steering Committee Meeting.
26 March 71	Final Draft of Study to Steering Committee.
27 March 71	Steering Committee Meeting.
29 March 71	Final Draft to Commanding General.

Inclosure 2. to Ltr of Instructions

List of Members and Participants of the Airmobile Operations Study Group

1. Steering Committee

BG Sidney B. Berry
 BG Olin E. Smith
 COL Edward P. Davis
 COL Lee E. Surut
 COL Donald E. Rosenblum
 LTC Archie A. Rider
 *LTC William L. Gallagher
 *LTC Carl P. Rodolph
 *LTC Horace B. Beasley
 LTC John C. Bard
 **LTC Roy S. Dunaway Jr
 **MAJ Darel S. Johnson

Asst Div Cmdr (Opns)
 Chairman
 Asst Div Cmdr (Spt)
 CO, 101st Avn Gp
 CO, 101st Abn Div Arty
 CO, 101st Abn Div Spt Cmd
 CO, 2d Sqdn, 17th Cav
 CO, 4th Bn, 77th Arty
 CO, 326th Engr Bn
 CO, 5th Trans Bn
 Asst Chief of Staff, G-3
 Dir, Working Group
 Asst Chief of Staff, G-2

*Deleted on 5 Apr 71

**Added on 5 Apr 71

2. Working Group

LTC Roy S. Dunaway Jr
 MAJ Gene A. Schneebeck
 MAJ William K. McDonald Jr
 MAJ Robert L. Clewell
 CPT Gary V. Burt
 CPT Taylor L. Conley
 CPT Francis S. Davis
 CPT Peter N. Federovich
 CPT John A. Jones
 CPT Gary L. Mevis
 CPT Ronald A. Nelson
 CPT James F. Peterman

Director
 326th Engr Bn
 DISCOM
 101st Avn Gp
 2d Sqdn, 17th Cav
 Div Arty
 101st Avn Gp
 101st Avn Gp
 Div Arty
 DISCOM
 101st Avn Gp
 101st Avn Gp

Inclosure 2 to Ltr : Final Report

X

5. Participants

BG John G Hill Jr
 COL Bruce Holbrook
 LTC Gerald W. Kirklighter
 LTC William N. Peachey
 LTC George F. Newton
 LTC Joseph F. Rutkowski
 LTC Robert A. Phillips
 MAJ John A. G. Klose
 MAJ Jack T. Clark
 MAJ Richard L. Mills
 MAJ Edward V. Mahoney
 MAJ Robert W. Sheffield
 MAJ Lloyd D. Mason
 CPT Charles M. Stancil
 CPT John C. Goertemiller
 CPT Joe H. Altman
 CPT Harvey C. Curry
 CPT William P. Stubbs
 LT Philip A. Clark
 LT Leighton

CG, 1st Bde, 5th Inf Div (Mech)
 CO, 108th Arty Gp
 CO, 223d CAB
 CO, 158th AHB
 CO, 159th ASHB
 CO, 14th CAB
 S3, 101st Avn Gp
 S3, 223d CAB
 CO, A Trp, 2d Sqdn, 17th Cav
 CO, A Btry, 4th Bn, 77th Arty
 ALO, USAF
 Asst G2, 101st Abn Div (Ambl)
 S3, 2d Sqdn, 17th Cav
 4th Bn, 77th Arty
 TOC Adv, 1st ARVN Inf Div
 4th Bn, 77th Arty
 2d Sqdn, 17th Cav
 2d Sqdn, 17th Cav
 Asst G2, 101st Abn Div (Ambl)
 ALO, USAF

15

TABLE OF CONTENTS

VOLUME I

	<u>Page</u>
TABLE OF CONTENTS	XII
INDEX OF FIGURES	XV
1. PURPOSE	I-1
2. LAMSON 719	I-1
3. MISSION OF 101st AIRBORNE DIVISION (AIRMObILE)	I-2
4. OPERATIONAL ENVIRONMENT	I-3
a. Location - operational area	I-4
b. Location - allied bases and staging areas	I-5
c. Weather	I-5
d. Terrain	I-7
e. Landing Zones	I-8
f. RVNAF ground operations	I-8
g. Enemy	I-12
h. Mid-intensity conflict	I-16
5. SPECIAL FACTORS	
a. Combined operation	I-17
b. Airmobile command arrangements	I-18
c. Aviation task force organization	I-19
d. USARV support	I-19
e. USAF support	I-20
f. Sense of urgency in providing airmobile support	I-21
6. AVIATION ORGANIZATION	I-21
a. Command and control	I-23
b. Assault helicopters	I-23

6. AVIATION ORGANIZATION (continued)	
c. Medium and heavy lift helicopters	I-24
d. Attack helicopters	I-24
e. Aerial rocket artillery	I-24
f. Air cavalry	I-25
7. XXIV CORPS JOINT COORDINATING GROUP	I-25
8. ALLOCATING AVIATION ASSETS	I-27
9. PLANNING AIRMOBILE OPERATIONS	I-28
10. THE AIRMOBILE TEAM AND ITS TECHNIQUES	I-29
a. Command and control	I-29
b. Reconnaissance	I-30
c. Firepower	I-32
d. Troop lift	I-35
e. Heavy lift	I-35
f. Support	I-36
11. OTHER TECHNIQUES	I-37
a. Selecting landing zones	I-37
b. Selecting pickup zones	I-38
c. "Secure" landing and pickup zones	I-38
d. Approach and departure routes	I-38
e. Determining LZ time	I-39
f. Determining PZ time	I-39
g. Air strikes	I-40
h. Armed helicopters	I-40
i. Smoke	I-41
j. Flight routes	I-41
k. Flight altitudes	I-41
l. Aircraft dispersion in flight	I-42
m. Approaches and departures	I-42
n. Nap of the earth flight	I-43
o. Downed crew recovery	I-44

11. OTHER TECHNIQUES (continued)

- | | |
|--|------|
| p. Downed helicopter recovery | I-44 |
| q. Breaking off a combat assault or extraction | I-44 |
| r. Senior commander aloft | I-45 |

12. LOGISTIC SUPPORT OPERATIONS

I-45

- | | |
|----------------------------------|------|
| a. General | I-45 |
| b. Planning | I-46 |
| c. Conduct of support operations | I-47 |
| d. Withdrawal phase | I-49 |

13. OBSERVATIONS

I-49

- | | |
|---|------|
| a. Airmobility concept and principles sound | I-49 |
| b. Requisites for success | I-50 |
| c. Air Ground Operations System | I-50 |
| d. Reconnaissance and firepower | I-50 |
| e. Air cavalry | I-50 |
| f. Tactical air | I-51 |
| g. Armed helicopter-tactical air team | I-52 |
| h. Joint Coordinating Group | I-53 |
| j. Combat extraction of heavy equipment | I-53 |
| k. Radio consoles for command and control | I-53 |
| l. Protection against small arms fire | I-54 |
| m. Instrument equipment and training | I-54 |
| n. Air items and airmobile equipment | I-54 |
| o. Airmobile division organization | I-54 |
| p. Helicopter damage and losses | I-54 |
| q. Logistic support | I-55 |

INDEX OF FIGURES

18

<u>Figure</u>	<u>Page</u>
I-1 Area of Operations, LAMSON 719	I-4
I-2 Allied Bases and Staging Areas	I-6
I-3 Concept of the Operation	I-9
I-4 Modified Concept - Actual Operation	I-11
I-5 Enemy Dispositions, 1 Feb 71	I-13
I-6 Subsequent Enemy Dispositions, Early Mar 71	I-14
I-7 Initial NVA Antiaircraft Artillery Dispositions	I-15
I-8 Aviation Task Organization	I-22

CONFIDENTIAL

VOLUME I

1. (U) PURPOSE

The purpose of Volume I of this Final Report is to summarize salient points, observations, and considerations concerning the airmobile operations the 101st Airborne Division (Airmobile) (reinforced) conducted in support of Republic of Vietnam Armed Forces (RVNAF) in Laos during LAMSON 719 for the period 8 February - 6 April 1971.

2. (U) LAMSON 719

LAMSON 719 was an allied offensive operation of limited objectives and duration against North Vietnamese Army (NVA) supplies, base areas, lines of communication, and forces in the part of Laos immediately adjacent to the two northern provinces of the Republic of Vietnam. The objectives were to destroy supplies and installations, disrupt lines of communication, and destroy NVA forces. The broad aim was to reduce NVA capability for waging war in the south and to advance the security of the people of the Republic of Vietnam.

Strict rules governing United States military operations across the Laotian border made LAMSON 719 a special situation. While RVNAF could operate freely on the ground and in the air within the operational area in Laos, United States forces were restricted to air operations under specific rules of engagement and were prohibited from operating on the ground.

The result was that the Republic of Vietnam Armed Forces under command of the Commanding General, I Corps, Army of the Republic of Vietnam, planned and conducted ground operations in Laos; and United States forces under command of the Commanding General, XXIV Corps, United States Army, planned, coordinated, and conducted airmobile and aviation operations in support of RVNAF ground operations. There was some participation by aircraft of the Republic of Vietnam Air Force.

I-1

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The Commanding General, XXIV Corps, assigned Commanding General, 101st Airborne Division (Airmobile), the mission of planning and conducting airmobile operations in support of RVNAF in LAMSON 719.

3. (U) MISSION OF 101ST AIRBORNE DIVISION (AIRMOBILE)

The governing mission of the 101st Airborne Division (Airmobile) during LAMSON 719 was to plan and conduct airmobile operations in support of Republic of Vietnam Armed Forces. But the division had other missions as well, all related to or affected by LAMSON 719.

Other missions included the following:

a. Operating in Thua Thien province, the division's pre LAMSON 719 area of responsibility.

b. Providing an infantry battalion to the 1st Brigade, 5th Infantry Division (Mechanized) in Quang Tri province for the duration of LAMSON 719.

c. Taking over operational and security responsibilities of units of the 1st ARVN Infantry Division in Thua Thien and Quang Tri provinces and along the Demilitarized Zone thus permitting their deployment into LAMSON 719 operations.

d. Opening Route 547 from the Hue area into the A Shau Valley and conducting operations in the A Shau Valley as a diversion for LAMSON 719.

e. Moving a brigade of four infantry battalions into Quang Tri province.

f. Assuming command in March of all United States Army tactical units and responsibility for operations in the two northern provinces of the Republic of Vietnam to include security of staging areas, logistic installations, and lines of communication supporting LAMSON 719.

I-2

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2/ g. Supervising the closing of Khe Sanh combat base during the latter stages of LAMSON 719 and securing the movement out of western Quang Tri of RVNAF and US units.

In support of these missions, the division operated from three headquarters; the main headquarters at CAMP EAGLE in Thua Thien province, a tactical headquarters at Quang Tri Combat Base, and an advanced headquarters at Khe Sanh.

From the beginning, the Division Commander devoted his major attention to LAMSON 719 and kept at least one of his Assistant Division Commanders in fulltime support of the operations. During late January and most of February, the Assistant Division Commander (Support) operated from the forward headquarters at Quang Tri. From late February until early April, the Assistant Division Commander (Operations) operated from the advance headquarters at Khe Sanh. During March and early April, the Division Commander operated from the tactical headquarters at Quang Tri, while the Assistant Division Commander (Support) operated from main headquarters at CAMP EAGLE. The division staff was spread among the three headquarters.

A ways, airmobile support of LAMSON 719 had first priority in the division's plans, operations, and considerations. All the division's assets and resources were a reservoir from which LAMSON 719 was supported.

4. (C) OPERATIONAL ENVIRONMENT

Several factors shaped the environment in which airmobile operations were conducted in support of LAMSON 719. Chief among these were:

a. Location - operational area

LAMSON 719 was conducted on NVA home territory. (Figure I-1) The operational area was a long-occupied, extensively developed, heavily defended supply and logistic base, staging area, and communications and transportation center. Resident forces included administrative, logistic, quartermaster, and transportation units with organic

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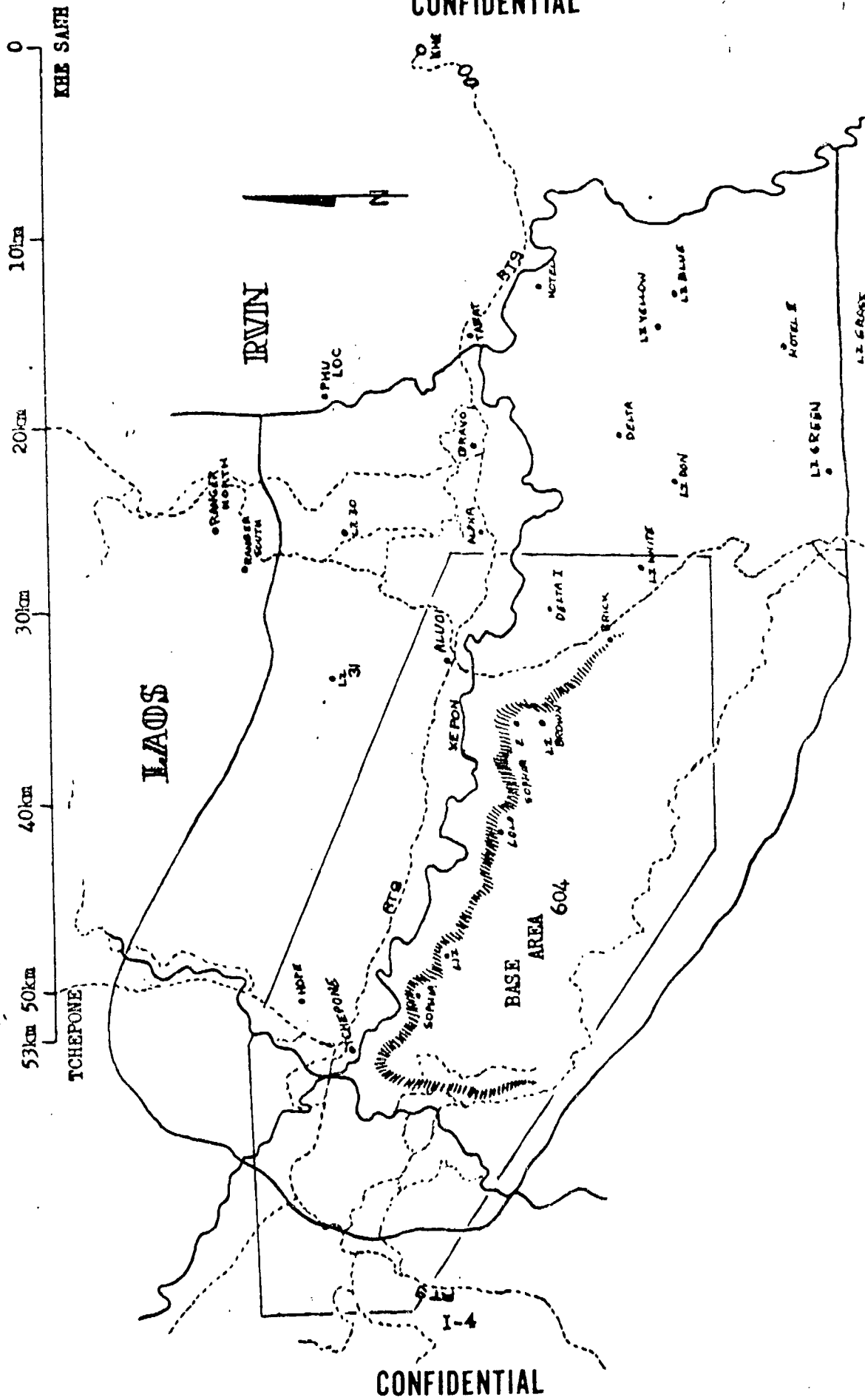


FIGURE 1-1 (U) Area of Operations, LAMSON 719 (U)

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security and air defense forces, as well as some tactical units. Familiar with the operational area, supported by local supply and logistic bases, dependent upon ground transportation, operating at the hub of a transportation and communications network, the NVA were relatively unaffected by the vagaries of weather, even though the operational area was located generally along the edge of the zone affected by significant weather variation.

b. Location - allied bases and staging areas

Allied bases and logistic installations were located along the coastal area of the northern provinces of the Republic of Vietnam. (Figure I-2) Consequently, it was necessary to open roads westward and establish supply bases, logistic installations, and staging areas in western Quang Tri province before airmobile and ground operations could be launched into Laos. Considerations of space, security, and maintenance dictated that most aircraft which supported LAMSON 719 should be positioned nightly at maintenance and support bases along the coast ranging from Quang Tri to Da Nang. This meant that weather conditions over a wide area affected aircraft which supported LAMSON 719. Logistic support of allied forces operating from western Quang Tri province depended upon keeping open Route 9 from Dong Ha and Quang Tri westward to Khe Sanh and upon weather conditions that affected flying from the coastal base areas to Khe Sanh staging area and then into the operational area in Laos. As RVNAF advanced westward, supply lines grew longer, more exposed to enemy action, and more greatly affected by weather conditions over a larger area.

c. Weather

Weather had a major effect on the timing of airmobile operations in support of LAMSON 719. The operational area itself was affected by the winds, clouds, precipitation, and ceilings of both the northeast and southwest monsoons during a seasonal transition from northeast to southwest monsoon. Weather conditions at any one or all of three locations directly affected airmobile operations: at coastal base camps where most helicopters were kept at night, the forward staging area at Khe Sanh, where only a few helicopters remained overnight, and in the operational area over Laos. The right combination

I-5

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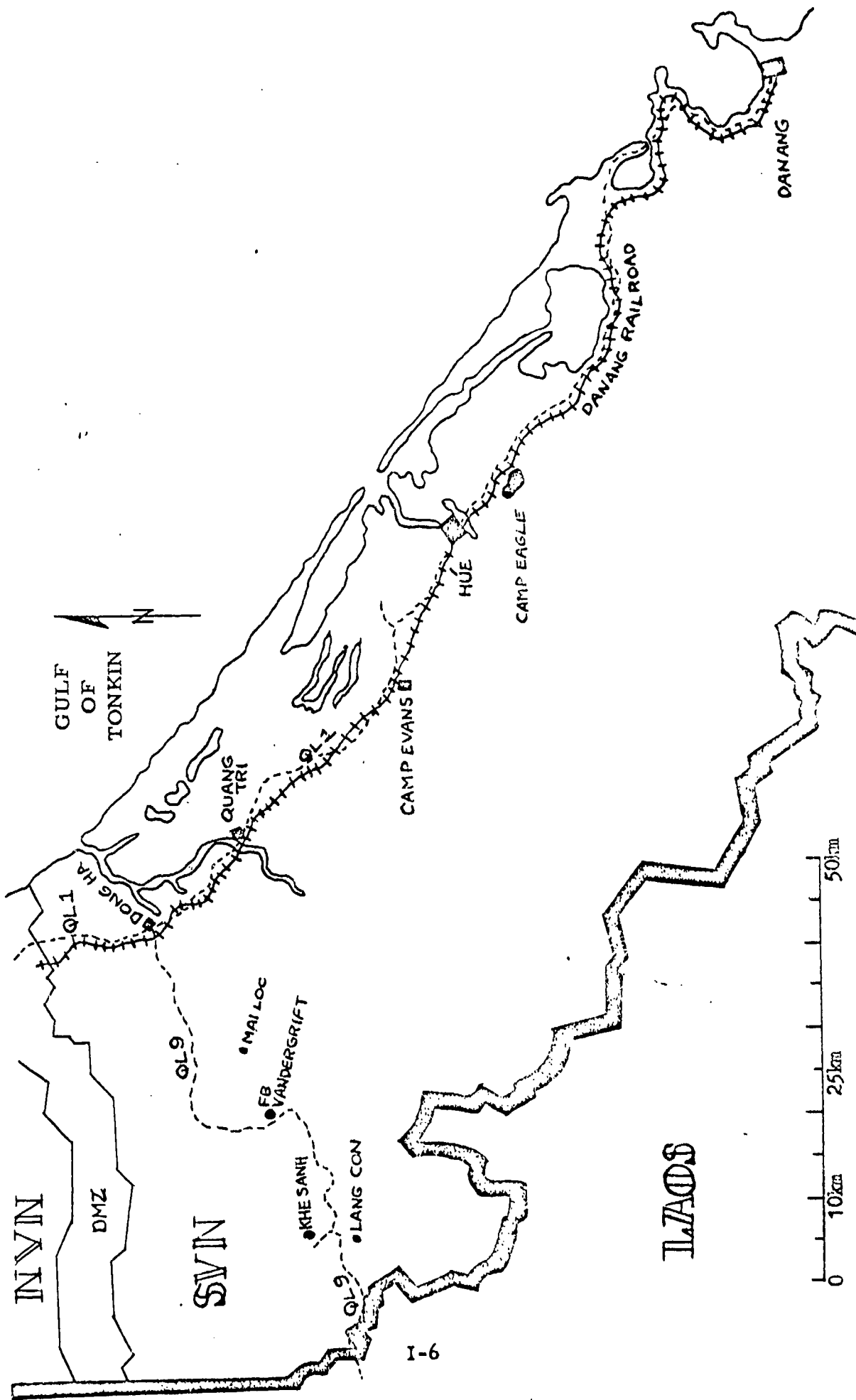


FIGURE I-2 (U). Allied Bases and Staging Areas (U)

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27

of weather conditions had to exist before helicopters could take off from night bases, land at Khe Sanh to refuel and be briefed for missions, and fly into the operational area over Laos. Early morning fog, rain, and cloud cover sometimes delayed airmobile and tactical air operations until late morning or early afternoon. Rarely did weather conditions preclude airmobile and tactical air operations all day long throughout the operational area. Occasionally airmobile operations were conducted under ceilings and weather conditions that precluded employment of close tactical air support. Sharply reduced visibility caused by a combination of natural haze, smoke and dust raised by artillery and air strikes, and flying into the afternoon sun frequently caused flying safety hazards and complicated command and control of aircraft.

d. Terrain

The landform of the operational area is divided into three fairly distinct parts. Central to the area and determinant of the direction of attack is the Xe Pon River valley which runs generally east-west with Route 9 paralleling the north bank of the river from the Laotian border to Tchepone. The floor of the valley varies in width from about two kilometers at its narrowest point to about five kilometers in the Tchepone area and has an average width of about three kilometers. The Xe Pon River is the single most useful navigational aid for aircraft flying under conditions of greatly restricted visibility.

The landform of the ground north of the Xe Pon River is broken, uneven, and mountainous with elevations increasing northward from the floor of the river valley and with the highest ground being north of and outside the operational area.

The landform of the ground south of the Xe Pon River valley is generally mountainous and uneven, although the mountains south of the river tend to be lower and more rolling than those to the north. There are, however, two distinct features that dominate the terrain and influence military operations: the Co Roc, a rectangular plateau about four kilometers long that rises abruptly just on the Laotian side of the border and dominates the Khe Sanh plateau in the Republic of Vietnam and Route 9 on both sides of the border, and an escarpment lying two

I-7

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28

or more kilometers to the south of and running parallel to the Xe Pon River that begins about twenty kilometers west of the border and extends westward for another twenty-five kilometers to a point south of Tchepone where the escarpment abruptly turns southward. Both of these pieces of high ground are dominant terrain. Both must be controlled by any military force that wishes to use Route 9 and move forces along the Xe Pon River valley into the Tchepone Plain.

Heavy vegetation covers the river valley, mountain slopes, and most mountain tops. Some clearings are located irregularly throughout the area, but these are usually small and on steep slopes. Some mountain tops have spots fairly free of vegetation, but they are usually littered with large boulders and outcroppings of rock.

The north-south feeder roads to Route 9 generally run along ridges or streams. Not all are visible from the air.

e. Landing Zones

There is a paucity of natural helicopter landing zones in the operational area. The few which do exist are usually one-ship or two-ship landing zones requiring hovering approaches and departures, are located either on high points or on low ground, and are so obvious to friend and foe alike that they were habitually defended by the NVA. Consequently, throughout LAMSON 719 it was usually desirable and necessary to construct new landing zones with USAF-delivered weapons at places selected jointly by the ground force and air mission commanders during the preparatory phases preliminary to an airmobile combat assault.

f. RVNAF ground operations

Ground operations of Republic of Vietnam Armed Forces had a determinant influence on supporting airmobile operations.

The original RVNAF concept of operations visualized an advance along three axes as far west as Tchepone. (Figure I-3) The Armored Brigade was to attack in the center along Route 9; the 1st ARVN Infantry Division, was to conduct a series of airmobile assaults westward in the

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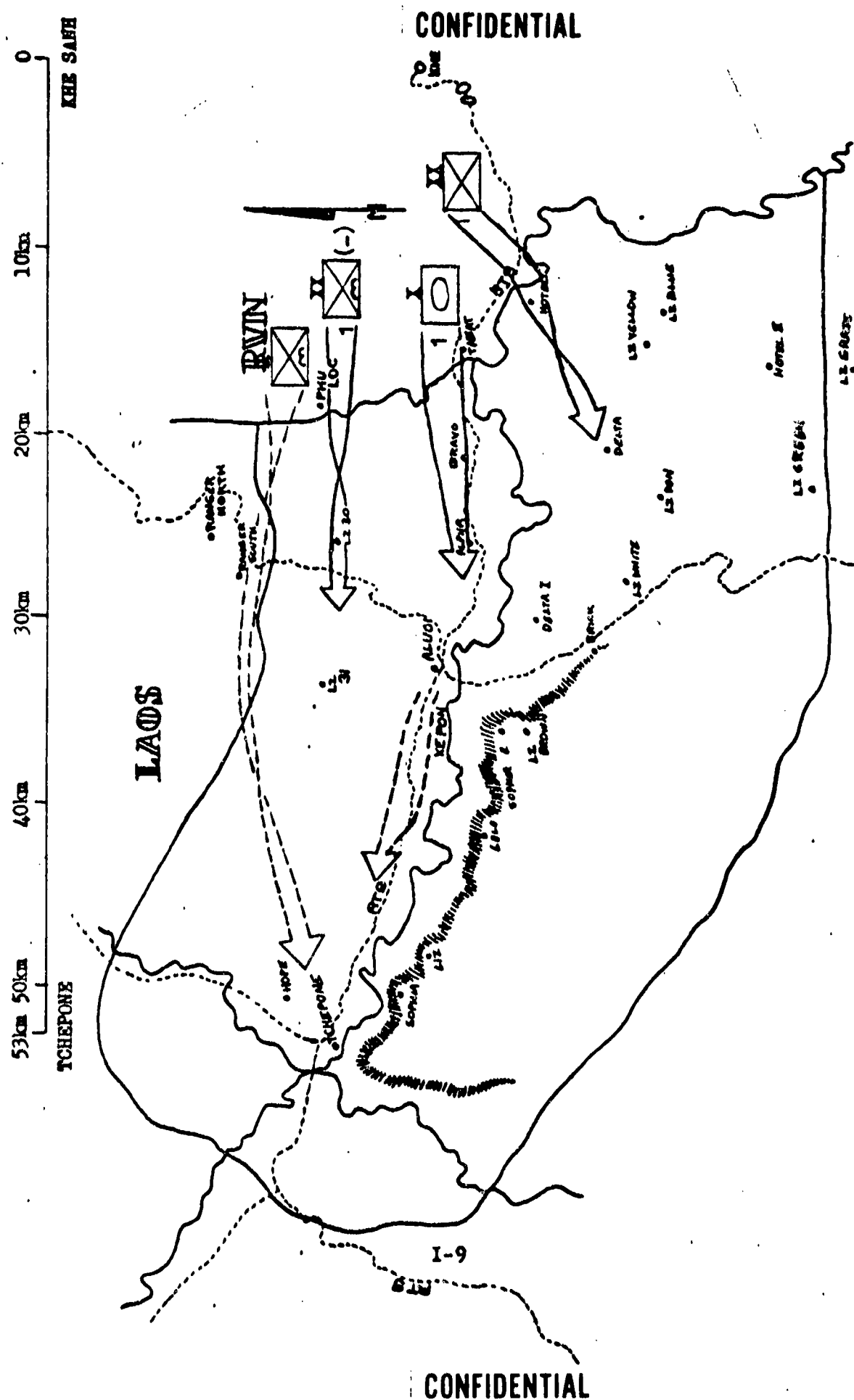


FIGURE I-3 (C). Concept of the Operation (U)

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30

rolling ground south of Route 9. The 1st ARVN Airborne Division was visualized as conducting the main airmobile attack all the way to Tchepone, where the Armored Brigade attacking westward along Route 9 would linkup with the Airborne Division. It was visualized that the Armored Brigade be resupplied by ground transport along Route 9 while the Airborne and 1st ARVN Infantry Divisions would be resupplied by helicopter. The Vietnamese Marine Division was initially in reserve. Fire support was to be provided by B-52 bombers, tactical air strikes, armed helicopters, and artillery firing from fire support bases located along Route 9 and high ground positions to the north and south of Route 9. Implicit in the planning was the assumption that RVNAF would be able to provide enough security to the fire support bases to permit helicopter landings and takeoffs free from direct small arms fire.

As normally occurs in war, the original concept of operations was modified according to the realities of the developing battle. (Figure I-4) The enemy violently contested the advance and moved his forces and weapons close around fire support bases. The armored Brigade advanced as far west as Firebase ALUOI less than halfway to Tchepone; halted; and was unable to keep Route 9 open for ground resupply. The 1st ARVN Airborne Division advanced by airmobile assault to Landing Zone 3J to the north of Firebase ALUOI; and the 1st ARVN Infantry Division advanced by airmobile assault to Firebase DELTA 1 to the south of Firebase ALUOI. Along this general line the advance westward paused for consolidation, while all units, including the Armored Brigade depended upon helicopter for resupply. Then the main airmobile assault effort was shifted southward to the 1st ARVN Infantry Division's area of operations, and freed the 1st ARVN Infantry Division to launch a series of airmobile assaults along the escarpment south of the Xe Pon River valley and Route 9 that led to seizure of the Tchepone area on March 6th. All the while, every RVNAF unit depended upon helicopters for resupply, medical evacuation, and logistic support; and it became normal for helicopters landing at and taking off from fire support bases, landing zones, and pickup zones to be subjected to direct small arms, rocket launcher, mortar, artillery, and 12.7mm machine gun fire.

I-10

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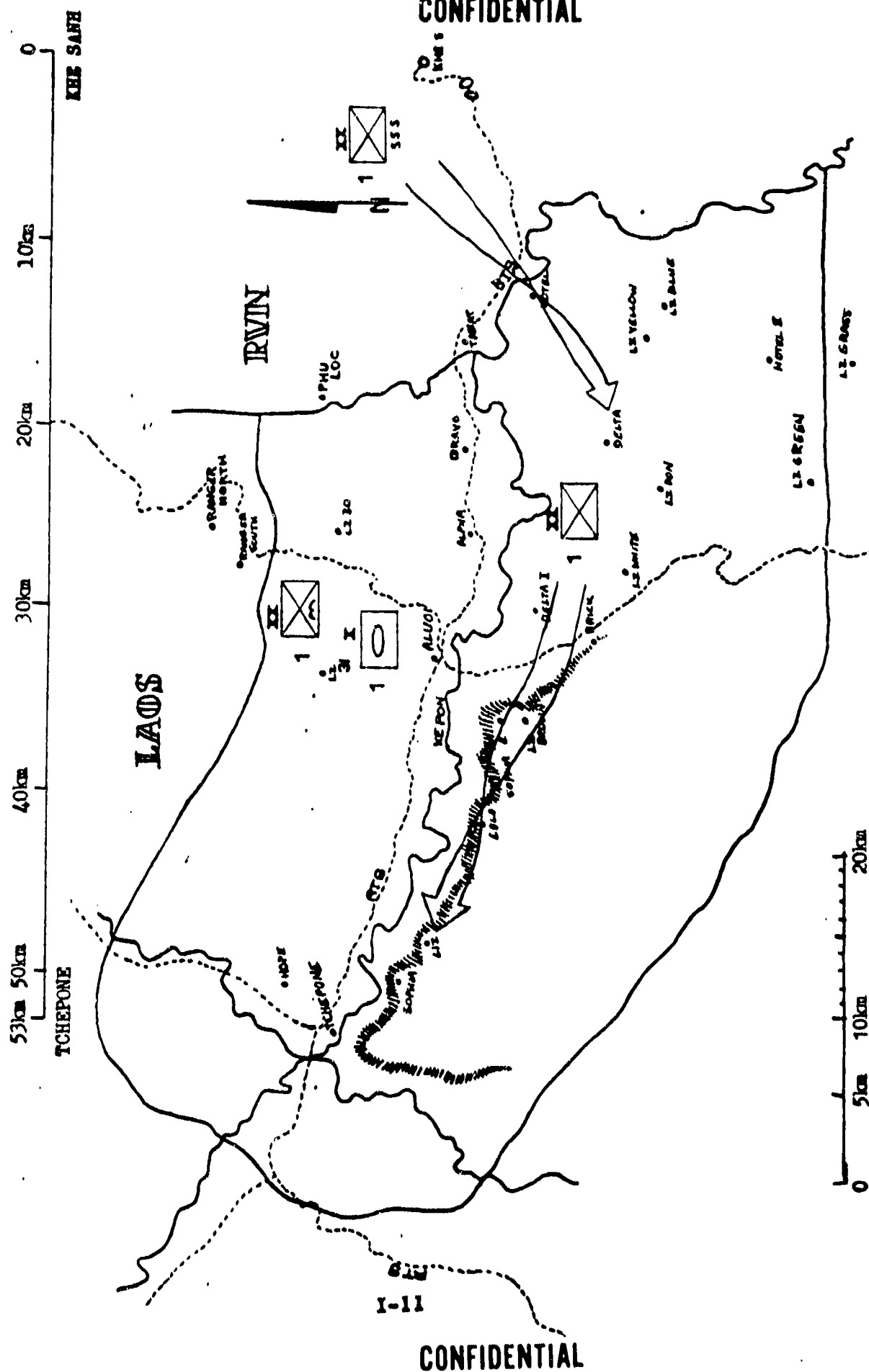


FIGURE 1-4 (C). Modified Concept - Actual Operation (U)

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g. Enemy (Figures I-5 and I-6)

The NVA reacted violently to the allied offensive in LAMSON 719. He aggressively employed his weapons and troops already present in the operational area, against allied forces using many of his service troops in a combat role. He reinforced heavily and committed a variety of weapons to include tanks, rockets, mortars, artillery, and antiaircraft weapons.

Ultimately, NVA forces in the area included elements of five divisions, twelve infantry regiments, at least two battalions of an armor regiment, and at least nineteen antiaircraft battalions. Reinforcements came from North Vietnam, the Republic of Vietnam, and other parts of Laos.

Throughout the operational area the NVA deployed an extensive, well-integrated, highly mobile air defense system which included large numbers of antiaircraft weapons of several calibers, the basic weapon being the 12.7mm machine gun. (Figure I-7) Some antiaircraft weapons were apparently radar-controlled. NVA forces had registered mortar, artillery, and rocket fires on most of the potential landing and pickup zones in the area, particularly those on high ground, and habitually employed indirect fire attack against most airmobile operations. The NVA was quick to mass its infantry and antiaircraft weapons around landing zones, pickup zones, and RVNAF troop positions and seized every opportunity to employ its entire family of antiaircraft, artillery, and infantry weapons against aircraft on the ground and in the air.

The 1st ARVN Infantry Division reported that throughout the operational area the NVA employed ten to twelve-man combat teams armed with small arms, one or two 12.7mm machine guns, an 82mm mortar, and one or two rocket launchers. Positioned on or near critical terrain, protected by bunkers and trenches, these combat teams attacked allied aircraft and infantry operating within range of their weapons. The teams could place 12.7mm machine gun, 82mm mortar, and often small arms and rocket launcher fire on virtually every landing zone, pickup zone, and friendly troop position in the operational area.

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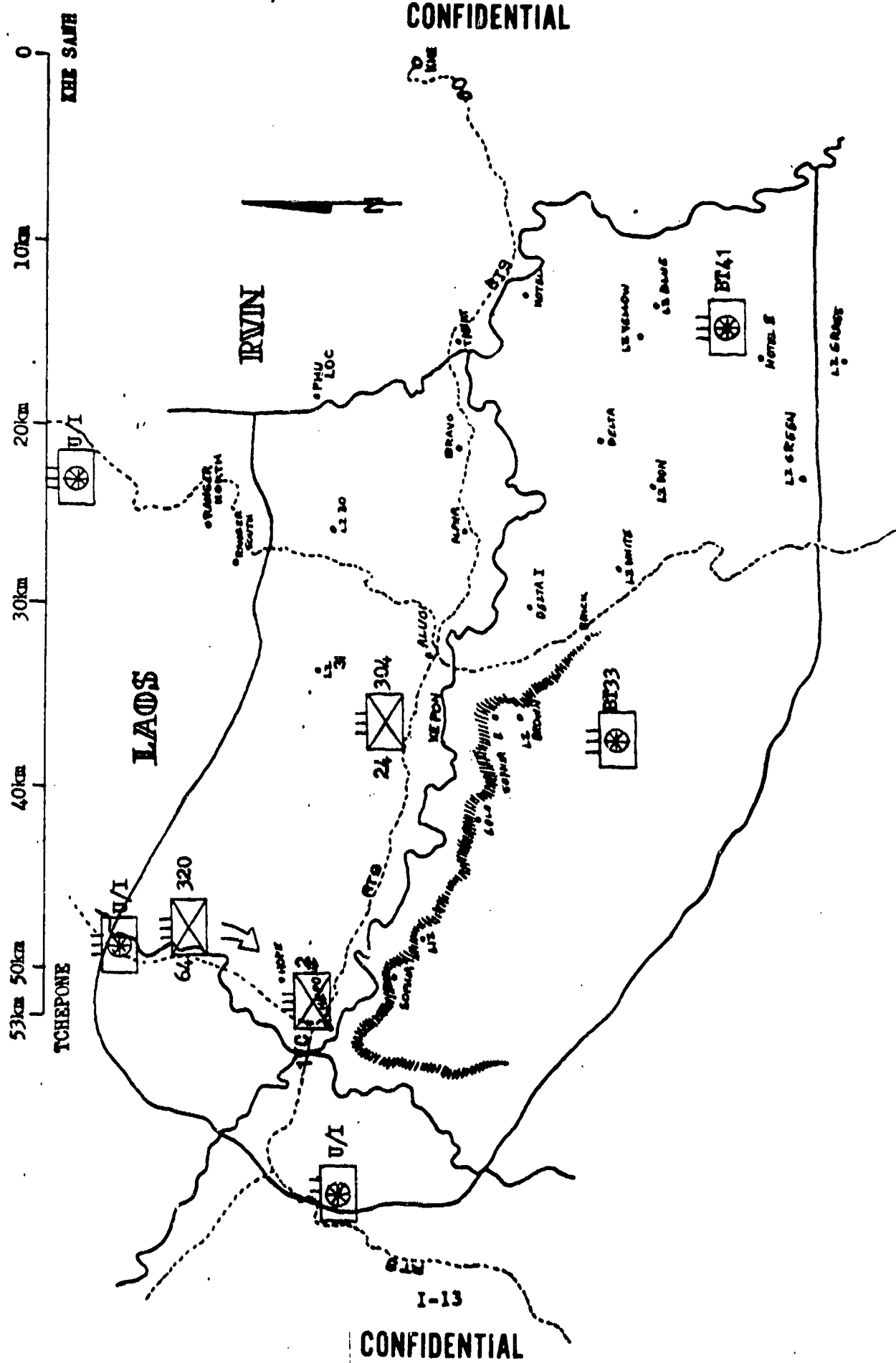


FIGURE I-5 (C). Enemy Dispositions, 1 Feb 71 (U)



HYICUPP 1-6 (C). Subsequent Enemy Dispositions, Early Mar 71 (U)

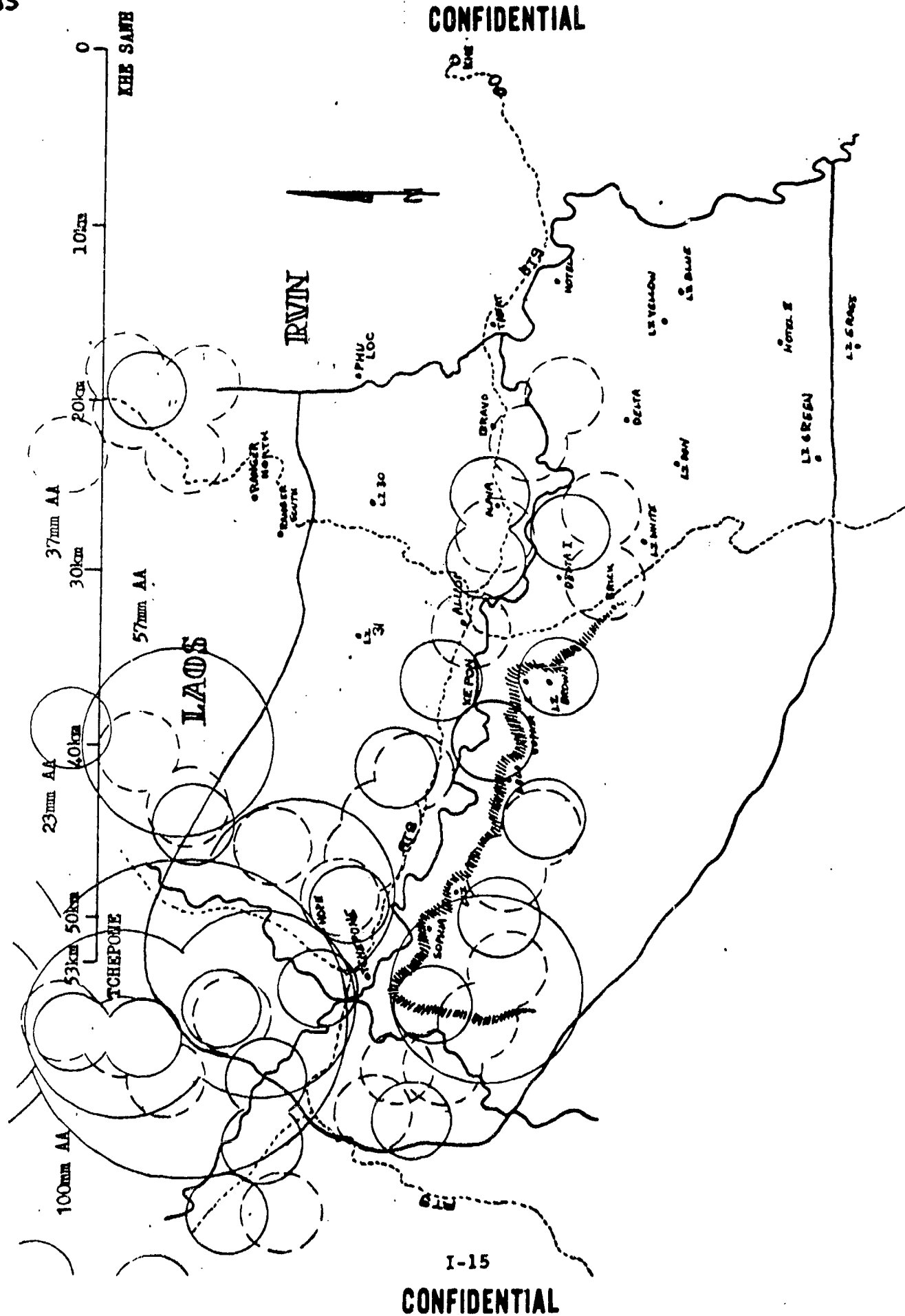


FIGURE I-7 (C). Initial NVA Antiaircraft Artillery Dispositions (U)

CONFIDENTIAL

36

An effective technique the NVA used was the "hugging" tactic of moving infantry and antiaircraft weapons as close as possible to friendly troop positions and landing and pickup zones. Using this tactic, NVA forces sometimes moved within 10 or 20 meters of friendly units manning perimeters and securing positions. This "hugging" tactic afforded the NVA a large measure of protection from supporting fires which friendly forces were often reluctant to bring in close enough to their own positions to harm the enemy and permitted the enemy to direct a heavy volume of short range small arms, antiaircraft weapons, and rocket launcher fire against helicopters flying in and out of the friendly position. On occasion, helicopters were fired at and hit by NVA riflemen lying on their back inside the barbed wire barrier surrounding a friendly position. On some occasions, helicopters landed in a pickup zone to be engaged by direct small arms fire from NVA infantrymen standing in or directly beside the pickup zone.

In summary, the NVA air defense system was built around the fire of numerous 12.7mm machine guns located throughout the operational area supplemented by the fires of larger caliber antiaircraft weapons for high-flying aircraft and the fires of small arms, light machine guns, rocket launchers, mortars, and artillery against aircraft flying in and out of landing zones, pickup zones, and troop positions surrounded by NVA forces using the "hugging" tactic. The enemy was usually quick to engage aggressively any aircraft passing within range with fire from all available weapons.

Consequently, every airmobile operation, even single-ship resupply and medical evacuation missions, had to be planned and conducted as combat operations complete with fire plan, escorting armed helicopters, and plans for securing and recovering downed crews and helicopters.

h. Mid-intensity conflict

The term "mid-intensity conflict" seems the most apt description for the level and type of combat and the operational environment experienced in LAMSON 719 by allied forces. Allied forces conducted ground and airmobile assaults against NVA base areas and lines of communication. Divisions, regiments, and battalions opposed each

I-16

CONFIDENTIAL

CONFIDENTIAL

other. Each side employed tanks, artillery, rockets, mortars, and a complete family of infantry weapons. NVA forces opposed allied air and airmobile operations with heavy antiaircraft fire from an extensive air defense system which effectively integrated its fires with those from infantry and field artillery weapons. The NVA engaged helicopters with fire from small arms, rocket launchers, light machine guns, 12.7mm and 14.5mm machine guns, and it seems accurate therefore to describe the operational environment of LAMSON 719 as approaching a "mid-intensity conflict with a hostile air defense environment." It is recognized that the absence of any NVA air assets were a significant factor in this special situation. Exactly where this particular hostile air defense environment falls in a total spectrum of potential enemy reaction is open ended. Whatever label is affixed to the air defense environment encountered in LAMSON 719, it represented the most intensive sustained antiaircraft fire experienced by US helicopters in this war.

5. (U) SPECIAL FACTORS

Several factors existed which made LAMSON 719 a special situation and which must be considered in any evaluation of airmobile operations conducted in support of LAMSON 719, particularly before drawing any conclusions applicable to airmobile operations conducted by the United States Army and supported by the United States Air Force.

a. Combined operation

LAMSON 719 was a combined operation conducted under unique circumstances. Being a combined operation, there was absence of the unity of command of ground and airmobile forces that characterizes airmobile operations conducted unilaterally by the United States Army. The operation, therefore, was conducted on a basis of cooperation and coordination between the ground and supporting airmobile forces. The operation was conducted across an international boundary which sharply and significantly defined the roles of the two participating national forces and delimited the role of United States Forces. The fact that United States personnel were forbidden to go on the ground in Laos required modification of normal procedures for supporting firepower, coordination and conduct of airmobile operations, and rescue and recovery

I-17

CONFIDENTIAL

of downed crews and aircraft. Absence of United States advisors with the ground forces and language difficulties added further complications. Nonetheless, a remarkable high degree of success was achieved in the conduct of airmobile operations based upon cooperation and coordination between the ground and aviation forces.

b. Airmobile Command Arrangements

Although it stems from the combined nature of the operation, the separate command of the ground units and supporting aviation units warrants special mention.

In airmobile operations conducted unilaterally by the United States Army, there is unit of command of ground and supporting aviation forces. The Airmobile Task Force Commander, normally the senior commander of the ground forces being airmobile assaulted or extracted, is in overall command of the airmobile operation. He is supported and assisted by the Air Mission Commander, normally the commander of the supporting aviation unit. The Airmobile Task Force Commander has the "go" or "no-go" power of decision in a United States Army airmobile operation, although he obviously gives great weight to the recommendation of the supporting Air Mission Commander.

During airmobile operations conducted in support of LAMSON 719, the ground forces and the Ground Commander were Vietnamese while the Air Mission Commander and the supporting aviation crews and assets providing airmobility were American. There was no Airmobile Task Force Commander in the sense used by the United States Army. The Ground Commander and the Air Mission Commander, although engaged in a common enterprise, were coordinate and co-equal. Each was responsible for a separate national force. Each national force had a different function. Therefore, "go" or "no-go" decisions were arrived at jointly through discussion, cooperation, and coordination. The same decision-making process governed selection of landing and pickup zones for airmobile assaults or extractions. Decisions were made by agreement. While no unmanageable problems arose from this situation, the decision-making process was slowed, complicated, and sometimes uncertain. Always there existed the potential

40

for communications difficulty. Often there was room for doubt that there had been complete communication and full understanding. But the system worked.

c. Aviation Task Force Organization

A special aviation task force organization was created to provide the extensive aviation support required by LAMSON 719. This aviation task force was built around the structure of the 101st Airborne Division (Airmobile) by supplementing the Division's organic assets with aviation and air cavalry units from other divisions, the 1st Aviation Brigade, and from units scheduled for deactivation or redeployment. The Division's 2d Squadron, 17th Cavalry, took operational control of supplemental air cavalry troops. The Division Support Command provided logistic and maintenance support for supplemental and organic units and established forward refueling and rearining points to support the operation. The 101st Airborne Division (Airmobile) used its command control structure to command the aviation and air cavalry units and to conduct the airmobile operations in support of LAMSON 7

d. USARV Support

LAMSON 719 was a unique operation accorded highest priority and massive support by United States Army, Vietnam. Circumstances permitted USARV to provide concentrated administrative, logistic, and maintenance support to United States Army units involved in LAMSON 719, particularly to the aviation units. Aviation units were ordered overnight into support of LAMSON 719. Supporting maintenance units were supplemented with men, parts, tools, and equipment. Aviation units supporting LAMSON 719 were given highest priority in repair and replacement of aircraft. The USARV Aviation Officer and key members of his staff and of the 1st Aviation Brigade spent many days in residence in the support and staging areas used by LAMSON 719 aviation units. Any evaluation of airmobile operations in support of LAMSON 719 should recognize that the priority and level of support provided aviation units during this unique operation was probably atypical of what can be expected during the average airmobile operation.

41
e. USAF Support

In the normal airmobile operation conducted by the United States Army, the United States Air Force provides support according to provisions of the Air Ground Operations System agreed to for worldwide use by the Departments of the Army and the Air Force. The key element of this system is the Tactical Air Control Party which places at division, brigade, and battalion level, when appropriate, experienced tactical pilots who assist in planning tactical air support and controlling missions in support of ground forces. Key roles are played by the Air Liaison Officers and Forward Air Controllers who become full-fledged members of the ground units they support. These United States Air Force Officers provide valuable assistance to Army commanders planning and conducting airmobile operations and quickly become familiar with the operational concepts, methods, and techniques of the Army units they support. The personal and professional rapport established between Army and Air Force members of this team guarantees a high level of combat effectiveness, particularly in airmobile operations. The Air Ground Operations System employed by United States Forces has proven highly effective and satisfactory.

The special circumstances of LAMSON 719 influenced the normal working of the Air Ground Operations System insofar as the Army aviation and air cavalry units were concerned. The USAF Tactical Air Control Party attached to the 101st Airborne Division (Airmobile) continued working with the Division's ground units in its normally assigned area of operations in South Vietnam in a greatly increased area of responsibility. Most of the Division's aviation units, however, moved into support of RVNAF ground units operating in Laos. Forward Air Controllers attached to 101st Airborne Division (Airmobile) who were accustomed to working in support of in-country airmobile operations were not authorized to cross the border into Laos. Similarly, RVNAF ground units operating in Laos experienced modification of the implementation of the Air Ground Operations System they were accustomed to during operations in the Republic of Vietnam. Their normal supporting Forward Air Controllers were not authorized to operate in Laos, and their ground units operated without the United States advisors through whom most Vietnamese ground commanders usually talked to the Forward Air Controller providing close air support.

The result of the unique set of circumstances of LAMSON 719 was that the bulk of the close air support missions flown in support of RVNAF ground and airmobile operations were directed by "out of country" Forward Air Controllers who were accustomed to working in Laos independent of ground operations and governed by classified rules of engagement and who were unaccustomed to working in close support of ground and airmobile operations. As the operation progressed, RVNAF, US Army, and US Air Force units and individuals became accustomed to working with each other in the operational environment of LAMSON 719.

f. Sense of Urgency in Providing Airmobile Support

The special circumstances of LAMSON 719 and its obvious critical importance to the Republic of Vietnam and the United States led to an unusual sense of urgency on the part of commanders, crews, and units who provided airmobile support to RVNAF units in Laos. Provision of airmobile support was the principal, most visible, most obvious American contribution to LAMSON 719. Indeed, the success of LAMSON 719 appeared to depend on the effectiveness of supporting airmobile operations. United States Army aviation provided RVNAF its principal means of mobility, medical evacuation, resupply, and transportation for senior commanders, as well as a major source of supporting fire and reconnaissance. As the campaign progressed, it became evident that for some RVNAF units, United States Army aviation offered the only means for extraction from the battlefield.

6. (U) AVIATION ORGANIZATION (Figure I-8)

The 101st Airborne Division (Airmobile) commanded all United States Army aviation units employed in direct support of LAMSON 719. From the beginning to the end of LAMSON 719 the following aviation units augmented those organic to the division: four assault helicopter companies (UH-1H), three armed helicopter companies (2-AH-1G and 1-UH-1C), two assault support helicopter companies (CH-47), two air cavalry troops, and two assault helicopter battalion headquarters. Additional aviation units were placed under the operational control of the division during peak airmobile operations.

RVNAF

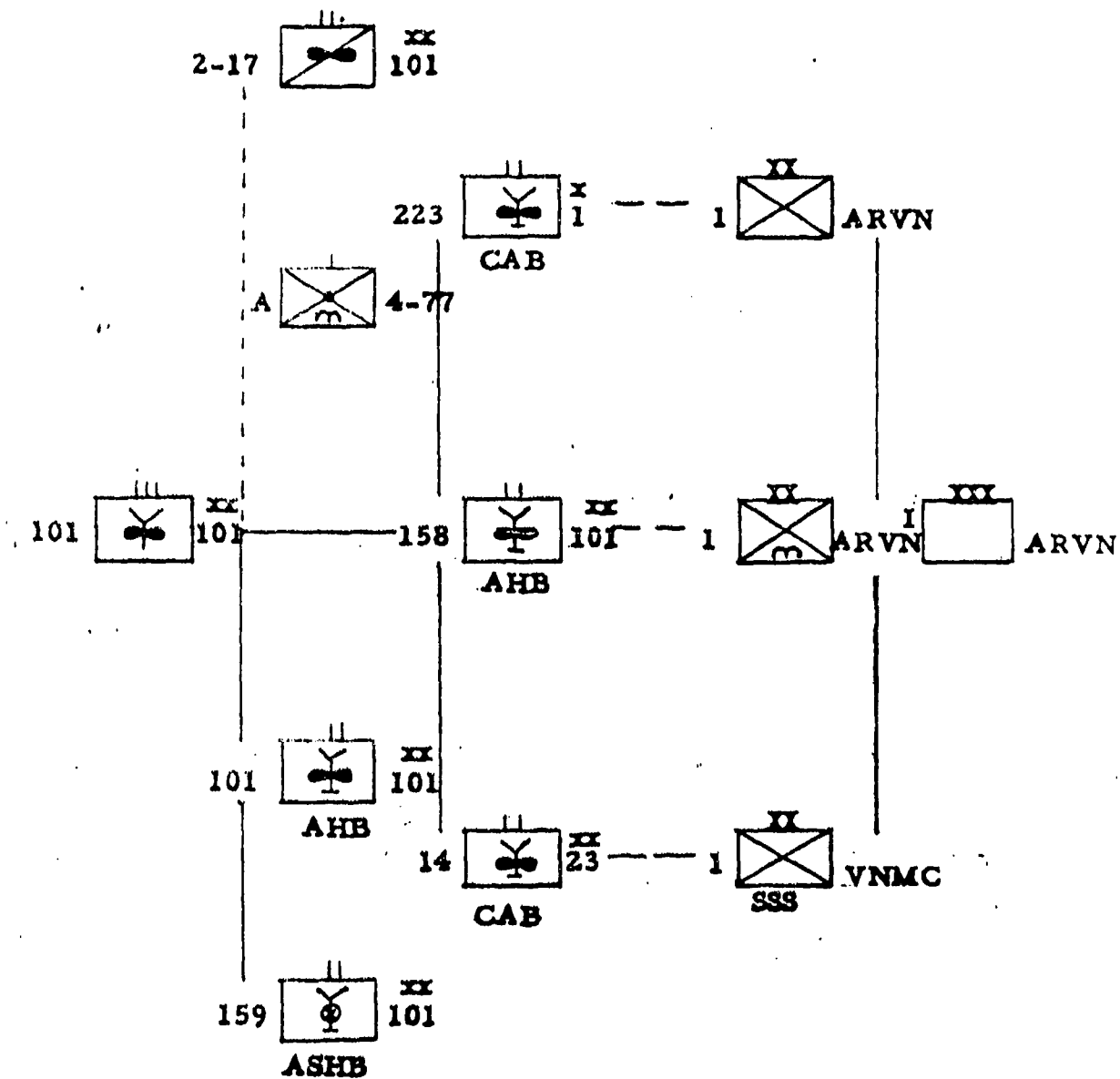


FIGURE I-8 (U). Aviation Task Organization (U).

44

a. Command and Control

Command Officer, 101st Aviation Group commanded all assault, assault support, and aerial weapons helicopter units. Commanding officer, 2d Squadron, 17th Cavalry commanded all air cavalry units. Commanding Officer, 4th Battalion (Aerial Artillery), 77th Artillery commanded all aerial rocket artillery. Commanding Officer, Division Support Command was responsible for medical evacuation operations. Commanding Officer, 101st Aviation Group employed his staff and his headquarters as the central planning and coordinating headquarters for all aviation activities in support of LAMSON 719. The Assistant Division Commander (Operations) was the Division Commander's on-the-ground representative and was overall coordinator of all aviation units supporting LAMSON 719. The collocation at Khe Sanh of the Division's advance headquarters and the tactical headquarters of the 101st Aviation Group facilitated and simplified command control. Located nearby were tactical headquarters from all supporting helicopter battalions, the aerial rocket artillery, the air cavalry, the Division Support Command and a control headquarters for medical evacuation helicopters. This facilitated the holding of briefings daily at 2000 hours at which was covered a review of the day's airmobile operations, a preview of the next day's operations, and discussion and policy guidance as appropriate. The evening briefings were essential to the conduct of airmobile operations in support of LAMSON 719.

b. Assault Helicopters (UH-1H)

An assault helicopter battalion provided direct support to each major RVNAF unit. The 158th Assault Helicopter Battalion supported the 1st ARVN Airborne Division, Ranger Group, and Armored Brigade. The 223rd Combat Assault Battalion supported the 1st ARVN Infantry Division. The 14th Combat Assault Battalion supported the Vietnamese Marine Division. The direct support helicopter battalion planned and controlled all combat assaults and general support missions for the supported unit. Each assault helicopter battalion kept an aviation liaison officer full time with the supported unit, and each battalion commander visited the commander of the supported unit at least once daily. Regardless of what aviation units provided helicopters to support of RVNAF unit, the direct support assault helicopter battalion headquarters always commanded the operations.

c. Medium and Heavy Lift Helicopters (CH-47, CH-53, CH-54)

Commanding Officer, 159th Assault Support Helicopter Battalion, 101st Airborne Division (Airmobile) was responsible for coordinating and performing all heavy-lift missions. Available to support this mission were five CH-47 Assault Support Helicopter Companies and one HC-54 Heavy Helicopter Company. Additional support was provided on a mission basis by a CH-53 helicopter squadron of the United States Marine Corps. An aviation liaison officer was provided each major RVNAF unit to plan and coordinate all heavy lift missions, and a Pathfinder Team of the 101st Aviation Group was located at all resupply bases and pads.

d. Attack Helicopters (AH-1G and UH-1C)

Availability of armed helicopters for the escort role was a limiting factor in how many different airmobile operations and missions could be conducted simultaneously. Virtually every mission into Laos required armed helicopter escort: combat assaults and extractions, single and multiple ship resupply, medical evacuation, and some command and control missions. The presence of many UH-1C armed helicopters complicated planning armed helicopter support, for this early-model armed helicopter could not keep up with or perform as well as the preferred AH-1G armed helicopter.

e. Aerial Rocket Artillery (AH-1G)

Although the aerial rocket artillery is normally controlled through artillery fire support channels, LAMSON 719 was an abnormal situation. A wide variety of communications channels were used to call for and control aerial rocket artillery in direct support of ground and airmobile operations in LAMSON 719. Aviation, artillery, advisory, air cavalry, and RVNAF communication channels all were used to call for and direct the fires of the aerial rocket artillery, the aerial rocket artillery responded with flexibility and effectiveness to this unpredictable variety and heavy volume of calls upon its service. In view of the situation, the Commanding Officer, 101st Aviation Group exercised de facto coordination through the 4/77 Artillery forward fire direction center at Khe Sanh of the employment and allocation of the aerial rocket artillery.

46

f. Air Cavalry

The air cavalry performed two principal missions during LAMSON 719: reconnaissance to the front and flanks of ground operations and reconnaissance and security of landing and pickup zones before and during combat assaults and operations. Operating with four air cavalry troops in direct support of LAMSON 719, the commanding Officer, 2d Squadron, 17th Cavalry was the principal reconnaissance officer for the operation. He was assigned tasks directly by the Commanding General, I Corps and delivered his reports directly to the Commanding General, I Corps and the Commanding General, XXIV Corps as well as to the Commanding General, 101st Airborne Division (Airmobile). This system of assigning tasks and multiplicity of reporting channels testified to the critical role played by the air cavalry. Because of their great mobility in the air cavalry, RVNAF units initially tended to employ the air cavalry in the close fire support role rather than in a reconnaissance role.

7. (U) XXIV CORPS JOINT COORDINATING GROUP

In early March 1971 an organization was established which greatly facilitated the planning and conduct of air mobile operations in support of LAMSON 719. The Commanding General, XXIV Corps established the XXIV Corps Joint Coordinating Group as a personal liaison group to the Commanding General, I Corps, ARVN. This group was collocated with the tactical headquarters and usual personal location of the CG, I Corps in the Khe Sanh area.

The purpose of the XXIV Corps Joint Coordinating Group was to expedite the process of planning and coordinating the use of United States assets in support of RVNAF operations in Laos. The Group provided information and advice to the two Corps Commanders: assured response to the requirements and priorities of the Commanding General, I Corps; and expedited implementation of the orders of the Commanding General, I Corps; and expedited implementation of the orders of the Commanding General, XXIV Corps.

The Commanding General, XXIV Corps directed the Commanding General XXIV Corps Artillery to establish the Joint Coordinating Group.

and designated him as Chief. In this capacity, the Commanding General, XXIV Corps Artillery acted as the personal representative of the Commanding General, XXIV Corps and not as Corps Artillery Commander. Further, the Commanding General, XXIV Corps designated the Assistant Division Commander (Operations), 101st Airborne Division (Airmobile) as Army Aviation Officer of the Joint Coordinating Group with headquarters at Khe Sanh itself. A general officer from ODCSOPS, 7th United States Air Force participated in the Joint Coordinating Group on a periodic basis.

To support the work of the Joint Coordinating Group, a Tactical Coordination Center was established immediately adjacent to I Corps Tactical Headquarters. It provided an extensive communications network with XXIV Corps units and headquarters, and included representatives and liaison officers from ACofS, G3 XXIV Corps; XXIV Corps Artillery; the Direct Air Support Center which supported LAMSON 719; and the 101st Airborne Division (Airmobile).

Existence of the XXIV Corps Joint Coordinating Group and the membership thereon of the Assistant Division Commander (Operations) greatly facilitated planning and conduct of airmobile operations in support of LAMSON 719 in accordance with the needs and priorities of the Commanding General, I Corps. The Assistant Division Commander (Operations), usually accompanied by the Commanding Officer, 101st Aviation Group, or the Group S-3, regularly attended sessions conducted by the Commanding General, I Corps and his staff. The Commanding Officer, 2d Squadron 17th Cavalry usually attended the late afternoon meetings. During these two regular meetings the I Corps Commander gave his planning guidance and stated his priorities for airmobile support. The Assistant Division Commander (Operations) acquainted the Corps Commander with the availability, capabilities, and limitations of aviation support, recommended allocations of aviation assets in accordance with the announced priorities, and reported status and results of airmobile operations. As airmobile operations progressed during the day, the Assistant Division Commander (Operations) would either personally or through the Chief, Joint Coordinating Group, pass information, recommendations, and reports to the Commanding General, I Corps, and, when appropriate, seek additional guidance or re-ordering of priorities. Additionally, the

48

Assistant Division Commander (Operations) visited commanders of major subordinate RVNAF units and daily acquainted them with the availability, capabilities, and limitations of aviation units and their allocation according to priorities established by the Commanding General, I Corps. The fact that the Assistant Division Commander (Operations) was speaking as the de facto Army Aviation Officer of the Commanding General, I Corps gave him credibility with Vietnamese commanders and made them aware that aviation assets were allocated according to priorities established by the Vietnamese Corps Commander.

8. (U) ALLOCATING AVIATION RESOURCES

Several steps were involved in allocating aviation resources in support of LAMSON 719. The starting place was the priority of allocation established by the Commanding General, I Corps. Everything else followed. Major RVNAF units requested aviation support through the resident aviation liaison officer, who forwarded the request to his parent aviation battalion headquarters. The supporting aviation battalion reviewed and consolidated requests, discussed them as appropriate with the RVNAF unit, developed plans for complying with the requests, and forwarded the consolidated requests and plans to 101st Aviation Group. The Aviation Group then consolidated, analysed, and reviewed all requests; determined how best they could be accomplished; and allocated aviation resources in accordance with priorities established by the I Corps Commander. The final step in the allocation process was the Aviation Group Commander's early morning presentation of missions, plans, and recommended aviation allocations for the I Corps Commander's approval.

Three regular daily meetings provided the decision-making framework for allocating aviation resources. The Assistant Division Commander (Operations) and the 101st Aviation Group Commander attended all three meetings. At 1730 hours daily at his tactical headquarters near Khe Sanh, the I Corps Commander reviewed the day's events and provided planning guidance for the following day. At 2000 hours at the Division's advance headquarters, all aviation unit commanders met to review the day's operations, discuss subjects of common interest, and review missions, plans and tentative

49

allocation of aviation assets for the next day. Receipt of requests, planning, and allocation of aviation resources continued throughout each night at the 101st Aviation Group headquarters. Each morning at 0815 hours at his tactical headquarters the I Corps Commander reviewed the night's events, gave additional guidance for the day, and heard and approved the Aviation Group Commander's recommendations for allocation of aviation resources. It is significant that the Commanding General, I Corps, always approved without change the Aviation Group Commander's recommendations.

Invariably, as operations and battle actions developed each day, modifications in allocation and shifts of aviation resources became appropriate. These modifications and shifts were made on a case by case basis by the Commanding Officer of the 101st Aviation Group.

9. (U) PLANNING AIRMOBILE OPERATIONS

Detailed planning conferences preceded all combat assaults, extractions, and resupply missions. The basic planning conference at which detailed ground and airmobile plans were developed was conducted at the appropriate RVNAF major unit headquarters. It was attended by the appropriate Vietnamese commanders and staff members, by the direct support aviation battalion commander and his key staff members, and by the Aviation Group Commander or one of his staff officers. This planning conference was commonly referred to as the "AMC meeting" since its key element was the meeting of the aviation Air Mission Commander and the Ground Commander to work out the details of blending the aviation and ground units into an airmobile operation. Once the basic plan was developed for an airmobile operation, it was reviewed by the 101st Aviation Group Commander, Assistant Division Commander (Operations), and I Corps Commander and modified and scheduled according to the Corps Commander's priorities and the availability of supporting aviation resources. The planning and allocation processes were interdependent.

10. (U) THE AIRMOBILE TEAM AND ITS TECHNIQUES

50

The team that conducted airmobile operations in support of LAMSON 719 was built around the characteristics and capabilities of the family of helicopters and the abilities of the men who flew them. The team consisted of ground, helicopter, and fixed-wing aircraft units that combined their capabilities and efforts in a common enterprise. The airmobile team can be divided into six functional elements: command and control, reconnaissance, firepower, troop-lift, heavy-lift, and support. Armed helicopters were integral to the reconnaissance element (air cavalry gunships), firepower element (aerial rocket artillery), and troop-lift element (escort gunships). These aircraft habitually escorted the heavy-lift and support elements and benefited the command and control element.

The following comments describe the function elements of this team and the techniques used during LAMSON 719:

a. Command and control

This element consisted of the Ground and Air Mission Commanders, their deputies, and staff members who planned, coordinated, directed, and commanded an airmobile operation. During an airmobile operation, a command and control party was continuously airborne over each critical point to direct the operation, assess its progress, provide guidance, and make decisions. The senior Ground Commander of the troops involved and the senior aviation commander of the aviation units involved, the Air Mission Commander, rode together in the same helicopter. All other command and control aircraft had aboard representatives of the Ground and Air Mission Commanders authorized to make recommendations and decisions in the name of their commanders.

Ideally, each command and control party was mounted in a UH-1H helicopter equipped with a radio console which provided an array of radios that permitted commanders and staff officers to communicate readily with appropriate ground and aviation units and elements. In fact, the number of UH-1H helicopters equipped with radio consoles with dependable operating radios was a limiting

factor. Often command and control parties were required to fly in UH-1H aircraft that lacked radio consoles and were forced to depend on PRC-25 radios for communications.

Occasionally, four command and control aircraft and parties were required to provide continuous airborne coverage over the critical points of an airmobile operation which involved extraction of troops from one field location and combat assault into another field location. It frequently happened during LAMSON 719 that the enemy attacked both the pickup and the landing zones used by a unit. Under such conditions, a command and control party was required above the pickup zone and another above the landing zone. Two other command and control parties were often required to replace on station the principal command and control parties, particularly when there was a lengthy turnaround time between the operational area and the refueling point.

Before each operation, Ground and Air Mission Commanders established for themselves and within their organizations a clear succession of command in the event that they or their subordinate commanders became casualties. In a fast moving airmobile operation, it was essential to make plans that would reduce the possibility of a commander's loss disrupting the operation.

b. Reconnaissance

The reconnaissance element consisted of air cavalry units who performed the classic cavalry mission of reconnaissance and security. The air cavalry troop was the smallest unit normally assigned a reconnaissance and security mission. Prior to combat assaults, large resupply mission, and heavy-lift operations, air cavalry reconnoitered flight routes to and from the objective area, tentatively selected landing and pickup zones, detected enemy activity, located targets, and directed attacks by supporting firepower on enemy forces, weapons, installations, and suspicious areas in the objective area. The air cavalry commander initiated the preparatory fires on the landing and pickup zones, the approach and departure routes, and appropriate portions of the objective area. Whenever assets and circumstances permitted, the air cavalry

provided continuous reconnaissance at and near the objective area during the entire airmobile operation.

52

Specifically, it was normal for the air cavalry commander to arrive first at the objective area designated by the Ground Commander, commence his reconnaissance, and select tentative landing or pickup zones, approach and departure routes, and flight routes for recommendation to the Ground and Air Mission Commanders when they arrived over the objective area. Having made his tentative selection, the air cavalry commander, in conjunction with the artillery observer and forward air controller, commenced preparatory fires on landing or pickup zones and the approach and departure routes. By the time the Ground and Air Mission Commanders arrived over the objective area, the preparatory phases of the airmobile operation were well under way. In most cases, the Ground and Air Mission Commanders approved the recommendations of the air cavalry commander. In the few cases where the Ground and Air Mission Commanders selected landing or pickup zones other than those recommended by the air cavalry commander, the new zones were near enough to those recommended by the air cavalry commander to benefit by any preparatory fires already employed.

After the Ground and Air Mission Commanders arrived over the objective area and assumed direction of the preparatory fires, the air cavalry commander continued his reconnaissance around the objective area and assisted in target acquisition and employment of supporting fires. When the Ground and Air Mission Commanders judged the landing zones and approaches adequately prepared for combat assault, they shifted supporting fires and directed the air cavalry commander to conduct low-level reconnaissance of the landing zone to determine if it was ready for the combat assault to begin. This final reconnaissance just before the launching of the combat assault was the most crucial reconnaissance of all. The Air Mission and Ground Commanders usually approved the air cavalry commander's recommendation either to begin the combat assault or employ additional preparatory firepower. The air cavalry commander played a major role in target acquisition and direction of supporting fires, and he assumed interim command and control of the airmobile operation when the need arose. When a single airmobile operation involved

simultaneous extraction from one field location and combat assault into another field location, one air cavalry troop was employed over the pickup zone and a second troop over the landing zone. The air cavalry commander was accompanied by an artillery liaison officer and worked directly with a USAF Forward Air Controller flying overhead and working as an intimate member of the reconnaissance-firepower team. LAMSON 719 reaffirmed the value and importance of the air cavalry reconnaissance element to the airmobile team.

c. Firepower

The firepower element consisted of all who brought destructive and suppressive fire to bear on the objective, particularly on and around landing and pickup zones and their approach and departure routes. This element included ground artillerymen, aerial rocket artillerymen, armed helicopter crews, United States Air Force liaison officer, forward air controllers, and crews of B-52 bombers and fighter bombers.

The employment of firepower was planned, coordinated, and directed by the Ground and Air Mission Commanders ably assisted by the air cavalry commander. The governing principle was to place maximum firepower in minimum time in and around landing and pickup zones and along approach and departure routes. Massive and accurate application of preparatory firepower did more than any other single factor to guarantee success of airmobile operations, particularly combat assaults and extractions.

While all sources of firepower contributed to the success of airmobile operations, the mass of destructive firepower was delivered by the USAF. Multiple B-52 strikes prepared objective areas. Commando vaults and daisy cutter bombs constructed landing and pickup zones and alternate touchdown points. Bombs, rockets, CBU, napalm, and 20mm gunfire destroyed or neutralized enemy weapons positions and troop units. Then USAF aircraft laid a smoke screen to shield troop-lift aircraft from enemy fire and observation as they entered and departed landing or pickup zones.

54

The role of US artillery was limited by the range of the 175mm guns of XXIV Corps Artillery during airmobile combat assaults in LAMSON 719. RVNAF artillery in Laos was limited by the paucity of secure or geographically suitable fire bases and by the significant NVA antiaircraft capability against the heavy-lift helicopters. Language problems hindered the use by US commanders aloft of RVNAF artillery. For those landing zones within the range of the 175mm guns (32,000 meters) and 8" howitzers (16,800 meters), the volume of fire support delivered from forward position at TABAT just east of the Laotian border frequently contributed significantly to the success of the insertions and subsequent defense. Flak suppression fires were planned and executed in preparation of flight routes for combat assaults, combat resupply, and combat extractions. Targeting intelligence was a key factor in reacting to constant relocation of NVA antiaircraft weapons. As a technique, artillery fire was generally employed in both suppressive and destructive roles on the flanks of landing and pickup zones. US artillery was also actively engaged in target acquisition of NVA artillery positions and in the delivery of counterbattery fires into Laos. One significant limiting factor in the employment of artillery was the frequently necessary enroute changes in the locations of the LZ. This resulted in delays in firing the artillery preparations or in the cancellation of preplanned fires altogether. Additionally, early firing of LZ preparations risked the exposure of RVNAF intentions and consequent NVA reaction.

Armed helicopters provided the capability for detecting and immediately engaging battlefield targets of opportunity close to friendly troops on the ground unmatched by any other weapons system in the United States inventory. Armed helicopters operating with the air cavalry, aerial rocket artillery, and escorting troop-lift, heavy-lift, and support aircraft literally covered the battle area with their ability to respond immediately and accurately with their fire against known and suspected enemy weapons and positions. Armed helicopters often operated under low ceilings and weather conditions that restricted or precluded use of tactical air in close support of ground units or airmobile operations. Armed helicopters, particularly those of the air cavalry, played a key role in acquiring targets, directing artillery fire and tactical air strikes against them, and conducting battle damage assessments.

55

With specific reference to firepower used to prepare the landing zones, when the Ground and Air Mission Commanders considered the landing zone and approaches to have been adequately prepared with firepower, they shifted the fires to adjacent areas and sent the air cavalry to conduct low-level reconnaissance. If the air cavalry drew enemy fire or saw enemy activity or installations or suspicious areas judged to require additional firepower, resumption or preparatory fires was recommended. The fires were resumed until once again the Ground and Air Mission Commanders decided that the time has come to shift the fires and have the air cavalry conduct another low level reconnaissance. Only when the air cavalry recommended and the Ground and Air Commanders decided that the landing zone and approach route firepower preparation was adequate did the Air Mission Commander launch the assault. When the combat assault began, supporting fires shifted to adjacent targets and areas. The supporting fires continued until the combat assault was completed.

All commanders were alert to the possibility of the NVA concealing themselves and withholding fire during the air cavalry's low-level reconnaissance in order to deliver surprise fire against the troop-lift aircraft when they entered the landing zone.

The air cavalry-armed helicopter-artillery-tactical air combination proved unbeatable as a reconnaissance-target acquisition-firepower-battle damage assessment team.

d. Troop-lift

The troop-lift element consisted of the troop-lift helicopters, their escorting armed helicopters, and their commanders. The troop-lift is the raison d'etre of the airmobile combat assault or extraction. These troop-lift helicopters present the most lucrative, most vulnerable targets for enemy fire. Therefore, everything possible was done to secure the flight, landing, and takeoff of the troop-lift aircraft. Flight routes, flight altitudes, approach and departure routes, landing and pickup zones were all reconnoitered, selected, and prepared with firepower to provide maximum security for the troop-lift aircraft. Spacing between troop-lift aircraft was determined primarily by

conditions of visibility and size of the landing and pickup zones. For the combat assault, the most crucial phase began with the final approach and touchdown of the first troop-lift and continued until sufficient troop strength was landed to sustain itself in combat. The airmobile troop extraction entered its most crucial phase when the number of troops remaining on the ground dropped below that strength adequate to sustain itself against enemy attack. In each of these crucial situations the troop-lift commander found it necessary on behalf of the welfare of the troops on the ground to fly his crews and aircraft into situations whose level of risk would have been unacceptably high under other circumstances.

e. Heavy-Lift

The heavy-lift element consisted of CH-47, CH-53, and CH-54 helicopters used to lift and transport heavy equipment and bulk supplies, their escorting armed helicopters, and their command and control helicopters.

The heavy-lift aircraft brought into landing zones bulldozers which prepared artillery positions, cleared fields of fire, and dug in key installations and ammunition storage areas; artillery pieces and ammunition; CONEX containers equipped as communications centers and tactical command posts; barrier and fortification construction material; fuel, food, water, ammunition, and other bulk supplies or heavy equipment which could not be hauled by smaller aircraft.

Phasing of heavy-lift helicopters into a landing zone depended upon factors as progress of the combat assault into a landing zone, the clearing and securing of the landing zone and vicinity, fire support plan, relative freedom of the landing zone from enemy fires, and the Ground Commander's tactical plan. The large size of heavy-lift aircraft and the necessity for slow hovering flight when approaching or departing a landing zone make heavy-lift aircraft especially vulnerable to enemy fire near and on the landing zone. Frequently, it was appropriate to intersperse heavy-lift aircraft in the stream of troop-lift aircraft going into a landing zone. When this was done, the heavy-lift aircraft were given the right of way. Heavy-lift operations required continuous airborne command and control aircraft and parties just as much as other phases of the airmobile operation.

f. Support

The support element consisted of a variety of aircraft that played a supporting role to the other elements involved in an airmobile operation and whose major function was the security and recovery of downed crews and helicopters. The support element included the following:

- (1) Chase ships prepared to land promptly to extract crews of downed helicopters.
- (2) Medical evacuation helicopters equipped with jungle penetrators for extraction of wounded ground troops and crew members whose helicopter went down in vegetation that offered no nearby landing zone for a chase ship to land.
- (3) Maintenance helicopters prepared to land maintenance crews and riggers to repair or rig downed helicopters for extraction.
- (4) Troop-lift helicopters carrying one or more aerial rifle platoons prepared to land and to secure downed helicopters and crew when appropriate.
- (5) Included also in the support element were command and control helicopters and escorting armed helicopters.

The support element had responsibility for missions ancillary to the combat assault or extraction itself, but these missions were of critical interest to all aircraft crews involved in the airmobile operation. These support operations were planned, coordinated, and conducted just as carefully and thoroughly as every other phase of the airmobile operations and perhaps even more so, since the effectiveness of the support element operation had a direct effect on the morale of all aircraft crews involved in the airmobile operation.

Riggers, maintenance personnel, and medical evacuation helicopter crewmen were the only Americans authorized to set foot on Laotian ground and then only for specific missions of necessity to be completed in as short a time as possible.

Whereas American aerial rifle platoons of the air cavalry squadron were landed to secure and recover downed crews and helicopters in the Republic of Vietnam, they were not authorized to land in Laos. During LAMSON 719 aerial platoons were formed from the 1st ARVN Infantry Division's elite Ranger company known as the Black Panther (HAC BAO) to be used for securing downed crews and helicopters. The Black Panthers were under OPCON of the 2d Squadron, 17th Cavalry, during all of LAMSON 719.

The airmobile team then consisted of these elements: command and control, reconnaissance, firepower, troop-lift, heavy-lift, and support. In addition to the techniques specifically used by these elements, certain other airmobile techniques are discussed in the following section.

11. (U) OTHER TECHNIQUES

Some of the other airmobile techniques employed to cope with the operational environment and specific situations of LAMSON 719 are briefly described below.

a. Selecting Landing Zones

Commanders varied practices and avoided patterns in selecting landing zones and usually preferred landing zones constructed or created with bombs to natural landing zones. High ground landing zones were vulnerable to pre-registered enemy mortar and artillery fires and afforded enemy weapons on surrounding low ground 360 degree coverage of approach and departure routes. Landing zones on slopes and on relatively low ground were less likely to be anticipated by the enemy, less likely to receive pre-registered indirect fire attack, and offered some defilade from enemy fires. Constructed LZ's had obvious advantages over natural LZ's, the principal one being that their location was unexpected and required the enemy to make new calculations. Whenever possible, a minimum of three relatively widely separated touchdown points were constructed in the same general LZ area to permit aircraft to shift from one touchdown point to another when enemy fire zeroed in on the touchdown point being used.

b. Selecting Pickup Zones

Air Mission Commanders preferred to extract troops from pickup zones never previously used and at which the troops had recently arrived. This set of circumstances contributed to the possibility of surprising the enemy and completing the extraction before the enemy had time to react. On the other hand, Ground Commanders often preferred to have their troops extracted from occupied positions or from previously used pickup zones. As LAMSON 719 progressed, both Ground and Air Mission Commanders came to agree that, as a rule, extractions were conducted with greatest success and fewest casualties when a pickup zone was used for the first time by troops newly arrived at the location and when alternate pickup zones were located nearby for use when the enemy directed his fires on the pickup zone in use.

c. "Secure" Landing and Pickup Zones

Secure landing and pickup zones did not exist in LAMSON 719. Friendly firebases and positions were so small and widely dispersed and enemy forces and weapons so numerous and pressed in so close to friendly forces and positions that every landing zone and pickup zone in Laos was always potentially and usually in fact subject to enemy fire. Consequently, every mission including resupply and medical evacuation was planned and executed as a combat operation, complete with reconnaissance and fire support. Proximity of friendly forces inhibited use of defensive fires during missions into "secure" LZ's and PZ's. Commanders and aviators preferred going into new LZ's by combat assault supported by unrestricted firepower rather than into the so-called "secure" LZ's and PZ's when friendly troop locations inhibited employment of supporting and defensive fires.

d. Approach and Departure Routes

Commanders selected approach and departure routes with several factors in mind. Among these factors were direction of prevailing wind, landform, visual navigational aids during periods of reduced visibility, location of friendly forces and weapons, location of enemy forces and weapons, and potential defilade from enemy

60
weapons. The common practice developed of using the same route for approaches and departures since this maximized the benefits of preparatory firepower and concentrated the effect of the armed helicopters escorting and providing protective fires for the troop-lift helicopters flying in and out of the landing or pickup zone. Air Mission Commanders varied the approach and departure routes during the conduct of airmobile operations as required by wind, weather, and enemy action.

e. Determining LZ Time

" Determination of LZ time was based on no arbitrary schedule or set of conditions. Rather the time of landing was based on the adequacy of the preparatory firepower, the assessment of the air cavalry commander on his low-level reconnaissance, and the judgment of the Ground and Air Mission Commanders as to when the landing zone and its approach and departure routes were reasonably secure for the beginning of the combat assault and the insertion of troops. Toward the end of LAMSON 719 the practice of setting "tentative" LZ times fell into disuse and "decision times" were used instead. The point being made was that there was no such thing as an LZ time until the appropriate commanders established one based on their judgment of the situation in the objective area. It was not unusual for a commander to take the necessary time to apply massive amounts of firepower before commencing a combat assault. It was realized that it was far better to use too much rather than too little firepower before exposing men and aircraft to the dangers of a hostile landing zone.

f. Determining PZ Time

The Ground and Air Mission Commanders had far less flexibility in establishing PZ times for troop extraction from field locations than for establishing LZ times. Frequently, troop units engaged in a moving fight with the enemy would require extraction. In that event, the Ground and Air Mission Commanders would fly over the moving troop unit, guide them to a pickup zone, and commence extraction as soon as the lead troop elements reached the pickup zone. Under these circumstances it frequently became necessary to break off use

61
of one pickup zone as it came under heavy enemy fire and guide the troop unit to another pickup zone where the extraction would be resumed. Setting a PZ time under these circumstances was a matter of seizing the opportunity rather than keeping a predetermined schedule and required the maximum flexibility and resourcefulness.

g. Air Strikes

The massive firepower provided by air strikes was especially useful in support of airmobile operations, particularly combat assaults and extractions. Multiple B-52 strikes frequently began preparatory fires on objective areas. Tactical airstrikes were employed to assist in preparing landing and pickup zones and approach and departure routes. Ideally, a forward air controller was continuously overhead and air strikes were scheduled on station every ten or fifteen minutes from beginning of preparatory fires until completion of the combat assault or extraction. In LAMSON 719 both Vietnamese and US commanders normally gave first priority of air strikes to support of combat assaults or extractions, and it required a senior commander's decision to change this priority.

h. Armed Helicopters

The armed helicopter was an essential weapon in the operational environment of LAMSON 719. It provided a capability to locate and engage immediately targets of opportunity possessed by no other weapons system and it provided close fire support under weather conditions that precluded fixed-wing aircraft close support. The AH-1G (Cobra) was quite effective. The UH-1C was beyond its capability in this environment and tended to be more of a liability than advantage. Yet, every armed helicopter available including the UH-1C was flown daily because the armed helicopter was so essential to all phases of airmobile operations.

In the hostile air defense environment of LAMSON 719, it was necessary to provide armed helicopter escort for virtually every aircraft or group of aircraft that flew missions over Laos. Thus, the number of armed helicopters available for escort was a limiting factor in how many separate missions could be flown simultaneously.

62

Armed helicopters effectively performed the helicopter escort role. Escort armed helicopters were normally employed on the rear flanks of the lift helicopter formation, in position to provide immediate enroute suppressive fire. Prior clearance to fire along the flight route facilitated maximum effectiveness of escort armed helicopter fires. Escort armed helicopters immediately engaged enemy targets they observed. Lift helicopters receiving enemy fire marked the targets with smoke, and the lift flight leader directed armed helicopters to engage the target.

One technique for employment of aerial rocket artillery in support of combat assaults was particularly effective. During the combat assault when the artillery and air strikes shifted to adjacent targets and the troop-lift aircraft were landing the troops, aerial rocket artillery gunships orbited over the landing zone. When a target appeared, aerial rocket artillery gunships were directed from overhead orbit to engage the target immediately. They did so with promptness, accuracy, and capability for placing fires close to the friendly troops on the ground.

i. Smoke

Frequently United States Air Force fixed-wing aircraft laid smoke screens to shield landing and pickup zones from enemy observation during combat assaults and extractions. Ideally, sufficient smoke-laying aircraft were available to keep the smoke screen effective from before the first troop-lift helicopter touched down until the last departed. Six sets of air or twelve sorties proved most satisfactory for this mission. To have the smoke-laying aircraft on station at a specified time required sixty minutes advance notice. This requirement together with the flexibility of establishing LZ and PZ times did lead to problems of coordination and resulted occasionally in combat assaults or extractions being conducted without smoke or resulted in aircraft orbiting overhead, running out of fuel, and being sent back to their base without having been used. Most smoke screens laid by the Air Force were combined with casualty-producing CBU munitions. This gave added effectiveness to the smoke screen but also necessitated additional care to insure that the smoke was kept a safe distance from friendly troops.

j. Flight Routes

Flight routes were planned to avoid known enemy antiaircraft weapons and to pass over friendly positions when possible, thus providing safe havens for aircraft and crews that were forced to land. Flight routes were varied and changed from day to day and mission to mission depending upon location of friendly units and enemy antiaircraft weapons.

k. Flight Altitudes

Whereas in most areas of RVN, aircraft flying 1500 feet above ground level are considered relatively safe from ground fire, heavy small arms and antiaircraft weapons fire over Laos drove aircraft to fly at considerable higher altitudes. Altitudes between 4,000 and 6,000 feet above ground level were considered optimum for preventing losses to small arms and 12.7mm machine gun fire and for remaining below effective engagement altitude of larger caliber antiaircraft weapons.

l. Aircraft Dispersion in Flight

Single-ship and two-ship landing and pickup zones precluded use of mass formation flying. Flights of helicopters normally proceeded to objective areas in widely dispersed trail formation to reduce the possibility of loss of more than one aircraft to a single enemy weapons engagement. Conditions of restricted visibility occasionally necessitated aircraft to close up their trail formation in order to maintain visual contact with each other sometimes to a degree that aircraft were uncomfortably close together as they went into a landing or pickup zone.

m. Approaches and Departures

Steep, rapid descents into and ascents from landing zones while maintaining varying velocities in three direction were employed to reduce the accuracy and effectiveness of fire against aircraft from enemy weapons located near the landing zone and along approach and departure routes. Approaches and departures normally followed the

same route in order to take maximum advantage of the pre-landing reconnaissance and preparatory firepower.

n. Nap of the Earth Flight

Under certain circumstances combat assaults, resupply missions, and medical evacuation were better conducted by low-level, nap of the earth flight than by high altitude flight. Aircraft flying the nap of the earth presented fleeting targets to enemy gunners and gained surprise by their sudden and unexpected appearance in the landing zone and quick departure. When this tactic was used, a guide aircraft flew at a higher altitude above the low-flying aircraft to vector them to their objective. Nap of the earth flight was sometimes appropriate and effective when aircraft flew into a firebase or friendly position surrounded by enemy who used "hugging" tactics and placed accurate fire on the landing zone or when low ceiling forced pilots into choosing between flying the dangerous intermediate altitudes or at treetop level. Nap of the earth flight was not used frequently.

o. Downed Crew Recovery

The best time to rescue a downed crew proved to be immediately after the aircraft had gone down and before the enemy could react deliberately to the situation. The optimum situation existed when an aircraft went down, the unharmed crew got out, a chase ship landed beside the downed aircraft, the downed crew boarded the chase ship, and the rescuing helicopter departed without drawing fire. The usual ratio was one chase ship for every ten troop-lift helicopters, but a ratio of 1:5 was used in operations that promised to be particularly difficult.

The medical evacuation helicopters equipped with jungle penetrators rescued a sizeable number of downed crew members whose aircraft went down in areas that had no nearby landing zones for chase ships. Two medical evacuation helicopters with jungle penetrators were kept orbiting near the objective area for the quick rescue of downed crews during airmobile operations that promised to be difficult.

Whenever a crew went down, every attempt was made to rescue the crew or to determine for certain that there was no chance of survival. Remarkable success was enjoyed in recovery of downed crews.

p. Downed Helicopter Recovery

Whenever a helicopter went down in a relatively secure area such as a firebase, a friendly troop position, or a relatively quiet area where there was no known enemy activity and a good landing zone adjacent to the downed aircraft, there was a good possibility of recovering the downed aircraft if the attempt was begun immediately. First priority, of course, went to recovering the downed crew.

The usual downed aircraft recovery procedure was to conduct a low-level reconnaissance to determine if the condition of the downed aircraft warranted the risks involved to man and machines attempting the recovery. If the results of the reconnaissance so indicated, maintenance and rigging personnel were landed to determine the condition of the aircraft and to rig it for extraction. The next step was to bring in the recovery aircraft, usually a CH-47, to sling out the downed aircraft and return it to a base in the Republic of Vietnam.

In the recovery of downed aircraft as in the recovery of downed crews, promptness was the key to success.

q. Breaking Off a Combat Assault or Extraction

One of the most difficult decisions faced during airmobile operations in support of LAMSON 719 was that of breaking off combat assaults or extractions once begun. But when enemy fire against troop-lift helicopters entering and departing landing and pickup zones became so heavy and accurate and human losses and aircraft damage so great that the success of the airmobile operation was jeopardized, then the commander had to break off the operation and create conditions that permitted resumption of the operation.

There were several actions commanders took to create conditions that permitted resumption of interrupted combat assaults or

extractions. They used additional firepower, changed approach and departure routes and altitudes, shifted aircraft touchdown areas, or changed the landing or pickup zone itself. Troops in the landing or pickup zone assisted by attacking and destroying enemy forces and weapons and by directing supporting fires on lucrative targets, and by securing the original or an alternate landing or pickup zone.

r. Senior Commander Aloft

A senior airmobile commander was aloft over the operational area during the crucial phases of airmobile operations, particularly during combat assaults and extractions. This senior commander was separate from and senior to the Ground and Air Mission Commanders. His presence expedited decision-making and coordination and facilitated acquiring additional resources needed to support the operation. The senior airmobile commander monitored appropriate command and control of the action closely, provided guidance to the Air Mission Commander, kept higher headquarters informed, and called for additional resources for support as needed. He was a decision-maker and commander. Under importantly, the senior airmobile commander aloft received the recommendations of the Air Mission and Ground Commanders and personally make the crucial "go" or "no go" decision for crucial combat assaults and extractions. This command arrangement was essential for LAMSON 719. This principle may be equally valid for unilateral US Army airmobile operations.

The Assistant Division Commander's dual role as coordinator of United States aviation resources and as *de facto* aviation officer to I Corps Commander made it possible for him to carry out the role of senior commander aloft. On several of the raids which concluded LAMSON 719 a senior Vietnamese commander accompanied the Assistant Division Commander (Operations). This was the usual situation.

12. (U) LOGISTIC SUPPORT OPERATIONS

a. General

Although the report covers in detail the period from 1961 to 1969,

67
with the first airmobile assault into Laos, that assault could not have taken place without considerable preparation and logistic support well in advance.

b. Planning

Initial logistic planning in the Division was limited to only three individuals: The Assistant Division Commander (Support); Commanding Officer, Division Support Command; and the Commanding Officer, 426th Supply and Service Battalion. Because of this limited access to knowledge of the operation it was necessary for these three to personally develop all requirements in detail during a very short time period. The entire tactical and stationing plans were carefully analyzed to determine optimum locations of support operations and the size and types of support required. Once this was accomplished personnel requirements and detailed equipment listings were prepared.

Planning for supply requirements included calculation of re-fueling equipment needs. It was recognized early that the additional petroleum supply equipment required would not be available until subsequent to the time needed. A calculated risk was therefore taken with approval of the Assistant Division Commander (Support), to partially dismantle some existing facilities within the Division's normal area in order to provide the necessary equipment. This was done with full knowledge that the tactical situation and support required within the Division area of operations in Thua Thien province might be equally as heavy as that envisioned in Quang Tri.

It was also recognized by the logistic planning group that large quantities of air items would be required for delivery of supply and support of ARVN forces by helicopter. Planning was based on the assumption that ARVN forces would have little or none of this type equipment available. Based on the planned strength by type battalion to be supported and an estimated safety factor, a listing of quantities of air items was prepared. The quantities issued to ARVN forces in most cases closely approached the requested quantities.

Planning also was required for aerial rockets and ammunition (Class VA). Based on an analysis of aircraft density, operational areas

68

and anticipated utilization, an estimate of initial stockage of aerial rockets and ammunition was developed. These estimates again proved adequate to support the operation.

An expedient requirement/requisitioning system was planned for employment, consisting of simply preparing handwritten lists. The Commanding Officer, Division Support Command, delivered them personally to the Commanding General, Da Nang Support Command, for further delivery to USARV.

Another major planning consideration was determining the number of personnel and type skills required to support the reararm/refuel facilities. Availability was complicated by the fact that all refuel facilities in the Division area of operations prior to LAMSON 719 would continue to operate during the operation.

The planning groups recognized early that organic aircraft maintenance units would not be adequate to support the anticipated aircraft density. An additional company size element plus augmentation was recommended for attachment to the Division.

c. Conduct of support operations

It was recognized early that the large scale airmobile operation required to support LAMSON 719 could not be undertaken without adequate and timely logistic support. The bulk of the effort expended by DISCOM elements occurred during the period 28 January to 8 February. Subsequent to that, the supply functions were more or less routine. During the initial phase, however, there was constant pressure to get facilities operational on time. Establishment of the facilities was complicated by the fact that prior reconnaissance was not usually possible. This necessitated a hasty reconnaissance, immediate development of a layout of facilities and continuous day and night effort to meet established deadlines. The Commanding Officer, Division Support Command, operated out of field locations. The Assistant Division Commander (Support) was located at Quang Tri supervising the movement of all elements that were arriving into the area as well as establishing liaison with the XXIV Corps Forward. The CO, DISCOM, met with the Assistant Division Commander (Support)

twice daily (0900 and 1600) to report on progress, request assistance, and receive guidance. When the DISCOM Forward Command Post was established at Khe Sanh, the Assistant Division Commander (Support) spent the majority of the day at that location or visiting the other four DISCOM facilities.

In setting up refuel facilities, the largest and most difficult refuel point to establish was at Khe Sanh. This facility included 38 refuel points for all types of aircraft and a bulk storage capacity eventually reaching 300,000 gallons. The initial stockage of this facility was accomplished using 500-gallon collapsible bags which were filled and rigged for external loading by DISCOM personnel at Fire Support Base VANDERGRIFT, and then delivered by helicopter to Khe Sanh. An around the clock effort for almost five days was required to construct the facility and place it into full operation.

Rigging support by DISCOM personnel included the rigging of the engineer equipment required to construct the airfield at Khe Sanh, rigging the large quantities of culvert and equipment used to reopen Route 9 to the Laotian border, rigging of the hundreds of 500-gallon collapsible bags previously mentioned, rigging of the entire quantity of the matting used to construct the assault airstrip at Khe Sanh, and the technical assistance provided ARVN forces throughout the operation.

Another major area contributing to the success of LAMSON 719 was the highly responsive aircraft maintenance system functioning in support of the operation. The organization, location, and functioning of the operational activities insured successful accomplishment of the overall mission. Aircraft were repaired and returned rapidly to using units. A very high operational rate of aircraft availability was maintained throughout the operation.

Dustoff support for medical evacuation was characterized by the total dedication of the aircrews, who assumed severe risks on a routine basis to accomplish their mission. Early in the operation the Division was tasked to supervise all dustoff operations in support of both US and ARVN operations. Joint operational facilities with divisional and MEDCOM aircraft and personnel were established at Khe Sanh and Quang Tri. The magnitude of their effort is fully described in Volume II.

70

d. Withdrawal Phase

The CO, DISCOM, was initially tasked with the planning and coordination of the withdrawal of all 101st Airborne Division elements located in the vicinity of Khe Sanh and VANDERGRIFT. This mission was later expanded to include all units at Khe Sanh. A movements control center was established on 26 March 1971 and functioned until 1 April 1971. This center coordinated and supervised all US Army and US Air Force truck and air movements into and out of the Khe Sanh area during that period. The system functioned rapidly and smoothly as the entire assault airfield matting was airlifted out. Several thousand tons of ammunitions and supplies were moved by air and surface, and thousands of troops were also moved. Convoys consisting of more than four hundred trucks were not unusual. The road was carefully controlled and only a minimum of difficulty was encountered. This was especially critical between Khe Sanh and VANDERGRIFT since Route 9 could handle only one-way traffic in that area.

To reduce helicopter blade time while effecting a rapid withdrawal, a plan was devised whereby all disabled vehicles were transported by helicopter to Quang Tri while all rolling stock, CONEX's, and bulk supplies were lifted only to VANDERGRIFT or Mai Loc and then transported further to the rear by surface means.

13. (U) OBSERVATIONS

The following observations are based upon the experience of the 101st Airborne Division (Airmobile) acquired while conducting airmobile operations in support of LAMSON 719.

a. Airmobility concept and principles sound

Although LAMSON 719 should be considered a special case, the Division's experience in conducting airmobile operations in support of LAMSON 719 confirms the soundness and validity of the concept and principles of airmobility developed and practiced by the United States Army.

7/

b. Requisites for success

There are several conditions necessary for any airmobile operation to realize its full potential for success. Paramount among these are unity of command of ground and aviation units, and combination of ground and airmobile operations into a single, integrated campaign.

c. Air Ground Operations System

Although the unique conditions and circumstances of LAMSON 719 altered and modified some details of the implementation of the Air Ground Operations System agreed to by the United States Army and Air Force, the Division's experience reaffirms the soundness of the system as it normally operates. In view of the great flexibility of the airmobile division and its ability to operate over large areas and in view of the special capability of the air cavalry squadron to reconnoiter large areas and to acquire targets, it would be well to reexamine the provisions of the Air Ground Operations System as it applies to the airmobile division. Specifically, the air cavalry squadron would benefit and be far more effective if it were authorized its own Tactical Air Control Party specially tailored and equipped to support its reconnaissance and security operations.

d. Reconnaissance and firepower

Timely, thorough reconnaissance and responsive, massive firepower are essential to successful airmobile operations, particularly the combat assault and extraction. Air cavalry is the key to adequate reconnaissance. The combination of artillery, armed helicopters, and tactical air strikes effectively coordinated is the key to adequate firepower.

e. Air cavalry

Air cavalry is a versatile, valuable asset with great growth potential for the future. Combining into a single package reconnaissance and firepower, under a commander who can assume many additional responsibilities, the air cavalry squadron and its troops

can perform a wide variety of missions. The airmobile division would gain in strength and capability by having a second air cavalry squadron, thus giving the division commander the wherewithal to use one air cavalry squadron for division reconnaissance missions and the troops of the second squadron in support of the infantry brigades.

72

f. Tactical air

The firepower provided by tactical air is essential to the success of airmobile operations. Tactical air delivers heavy ordnance accurately. Air Liaison Officers play key roles in assisting the United States Army in planning use of tactical air. Forward Air Controllers play key roles in employing tactical air in support of airmobile and ground operations. In addition to the recommended attachment of a Tactical Air Control Party to the air cavalry squadron, an Air Liaison Officer should be attached to the Aviation Group. The effectiveness of tactical air support of airmobile operations would be further improved by providing tactical air fighter-bombers with longer on-station time over the objective area.

g. Armed helicopters

Without the armed helicopter, there could be no airmobile operations. The more effective the armed helicopter and the greater its capabilities, the more effective will be airmobile operations. The Army needs more armed helicopters with improved capabilities. The armed helicopter provides a capability for responsive, continuous, accurate, close fire support offered by no other weapons system within the US inventory.

Airmobile operations in an environment approaching mid-intensity conflict require more armed helicopters than in low-intensity conflict. Increased numbers of enemy antiaircraft weapons and high effectiveness of enemy air defense systems combined with close combat between ground units require more armed helicopters for reconnaissance missions, for suppressive and destructive fires, and for helicopter escort. The number of armed helicopters available for support was a limiting factor in the airmobile operations during LAMSON 719. The Division often was capable of flying more missions simultaneously than available armed helicopters could support.

The Army needs now tank-defeating armed helicopters. Had the Division entered LAMSON 719 with a helicopter armed with an accurate, lethal, relatively long-range anti-tank weapon, it would have destroyed many more NVA tanks and would have rendered more effective close support to RVNAF ground forces.

h. Armed helicopter-tactical air team

The armed helicopter and fixed-wing fighter-bomber form a natural, effective fighting team. Each weapons system has unique, complementary characteristics essential in support of the ground soldier and his operations.

Living and operating in the ground soldier's environment, the armed helicopter escorts troop-lift helicopters flying the soldier to and from his operations, escorts helicopters delivering ammunition, food, water, supplies, and mail to the soldier, and escorts the medical evacuation helicopter rescuing the wounded soldier from battle. The armed helicopter flies underneath ceilings measured in hundreds of feet to locate targets threatening or attacking the soldier to deliver timely, responsive, accurate fire within tens of feet of the soldier's position.

The fighter-bomber flies underneath ceilings measured in thousands of feet, to deliver heavy bombs within hundreds of feet of the ground soldier's position and lighter ordnance even closer.

The armed helicopter and fighter-bomber team worked effectively in LAMSON 719. Armed helicopters of the air cavalry reconnoitered objective areas, landing and pickup zones, and their approach and departure routes; acquired and marked targets on which the Forward Air Controller directed air strikes; conducted low-level bomb damage assessments; and worked with the Forward Air Controller in developing additional targets for air strikes. Armed helicopters and tactical air worked closely together to prepare the objective area, landing and pickup zones and approach and departure routes for safe passage and landing of the troop-lift helicopters. The armed helicopters then escorted troop-lift and heavy-lift helicopters in and out of the landing zone while the Forward Air Controller directed air strikes into adjacent target and danger areas.

i. Joint Coordinating Group

Establishment of the Joint Coordinating Group at the I Corps Tactical Headquarters led immediately to improved effectiveness in coordinating and conducting airmobile operations in support of LAMSON 719. Use of a similar technique would be worthy of consideration for any combined operation.

j. Combat extraction of heavy equipment

Combat conditions during LAMSON 719 made it infeasible to extract artillery, bulldozers, and other heavy supplies and equipment from several positions and fire bases. The risk to the crew and to the heavy-lift helicopter was not worth the relative value of the equipment left on the ground. This situation may not be uncommon in airmobile operations conducted in mid-intensity conflict. In future conflicts of the nature of LAMSON 719 commanders must seriously consider alternatives to establishing artillery fire bases as was done in LAMSON 719. Some alternatives are to operate without establishing airmobile artillery fire bases, to establish artillery fire bases only for brief periods of time and then move them, or to operate without any artillery support and depend upon infantry weapons, armed helicopters, and tactical air. Another option is to consciously accept the likelihood of being unable to extract artillery and heavy equipment and be prepared to write it off in return for whatever advantage it offered while providing fire support. Still another option is to provide artillery support from secure bases and to plan ground pickup with the artillery fire bases established by airmobile assault.

k. Radio consoles for command control

The airmobile commander needs better, more dependable, more versatile command radio communications than offered by the current radio console mounted in command and control helicopter. Inclusion of UHF and VHF radios in the radio console used by the Airmobile Task Force Commander and his Fire Support Coordinator and Air Liaison Officer would provide the ground command party the capability of talking with and monitoring air cavalry, tactical air, and aviation operations. Thus the Airmobile Task Force Commander

would have access to more information and be better able to command and control.

l. Protection against small arms fire

A helicopter and crew provided protection against .30 caliber small arms fire from a distance of 300-400 meters will have an appreciably greater chance of survival in an operational environment similar to that of LAMSON 719.

m. Instrument equipment and training

All aviators should be qualified as instrument pilots and proficient in instrument flight, and all helicopters should be equipped with the latest and best equipment for instrument flight. This would ensure a higher mission completion rate with a lower accident rate. As things now stand, aviators fly missions before first light, after last light, and in marginal weather conditions at considerable risk.

n. Air items and airmobile equipment

The experience of planning, conducting, and supporting airmobile operations during LAMSON 719 can usefully be reviewed and studied to determine the adequacy of issue and suitability of design of air items and airmobile equipment authorized the airmobile division.

o. Airmobile division organization

That the 101st Airborne Division (Airmobile) accomplished successfully its diverse tasks and responsibilities during LAMSON 719 attests to the soundness of the Division's organization and capabilities and suggests that further refinements of the airmobile division's organization can materially expand its already significant capabilities.

p. Helicopter damage and losses

The helicopter and its crew have proven remarkably hardy and survivable in the mid-intensity conflict and hostile air defense environ-

76

ment of LAMSON 719. There were remarkably few helicopters and crew members lost in view of the heavy small arms, antiaircraft, and mortar and artillery fire aircraft and crews experienced while conducting extensive airmobile operations on NVA home ground. This is even more remarkable in view of the numerous airmobile operations conducted in support of RVNAF ground units located in small perimeters, surrounded by NVA units and weapons, and often in heavy contact with the enemy.

To assess and evaluate properly aircraft and crew losses, one must measure these losses against the command campaign plan, arrangements, mission, total sorties, and number of exposures to enemy fire, and accomplishments. When viewed in this perspective, losses were few.

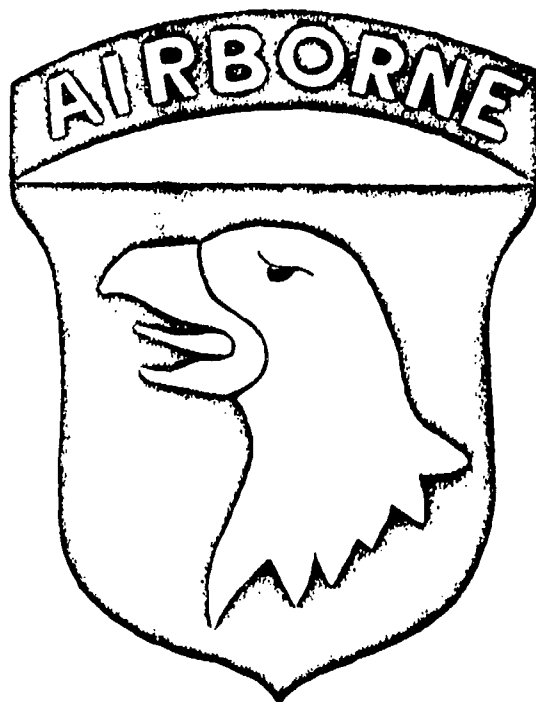
q. Logistic support

Use of extensive helicopter logistic lift during the early phase of the operation was necessitated by several factors including lack of fixed-wing airfield and poor road conditions. The operation could not have been launched on time without the thousands of tons of supplies and gallons of fuel delivered by heavy lift helicopter.

LAMSON 719 demonstrated that a definite requirement exists to establish theater contingency stocks of helicopter refueling equipment in support of airmobile operations. This equipment must be readily available, as far forward as possible, to support both additional operational requirements and replacement of combat losses.

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101ST AIRBORNE DIVISION (AIRMOBILE)



FINAL REPORT

AIRMOBILE OPERATIONS IN SUPPORT OF
OPERATION LAMSON 719
8 February - 6 April 1971

VOLUME II

1 May 1971
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TABLE OF CONTENTS

VOLUME II

	<u>Page</u>
TABLE OF CONTENTS	i
INDEX OF FIGURES	iii
SECTION I - INTRODUCTION	
A. Background	I-1
B. Objective	I-1
C. Special Considerations	I-2
D. Intelligence	I-3
E. XXIV Corps and I Corps Concept of Operations	I-4
F. Initial Ground Force Task Organization I Corps (ARVN)	I-8
G. Commitment of Additional Forces	I-9
SECTION II - AVIATION ORGANIZATION	
A. General	II-1
B. Special Considerations	II-1
C. Task Organization	II-2
D. CO, 101st Aviation Group Comments	II-6
SECTION III - CHRONOLOGY OF OPERATIONS IN LAOS	
A. Attack to ALUOI and Consolidation	III-1
B. Attack to Tchepone and Consolidation	III-2
C. Extraction	III-3
SECTION IV - AIRMOBILE OPERATIONS IN LAOS	
A. Concept of Operations	IV-1
B. Command and Control	IV-3
C. Allocation of Resources	IV-6
D. Air Cavalry Operations	IV-9

E. Combat Assaults	IV-16
F. Combat Extractions	IV-29
G. Heavy Lift Operations	IV-63
H. Fire Support	IV-66
I. Rearm/Refuel/Rigging	IV-70
J. Medical Evacuation	IV-89
K. Downed Crew Recovery	IV-97
L. Aircraft Recovery	IV-104
M. Aircraft Maintenance	IV-109
N. Personnel Summary	IV-129
O. Aviation Safety	IV-131
P. Aviation Statistical Summary	IV-142
Q. Combat Damage	IV-145

SECTION V - RAIDS

A. Concept	V-1
B. Initial Efforts	V-1
C. First Raid	V-2
D. Second Raid	V-3
E. Conclusions	V-3

SECTION VI - RESULTS

A. General	VI-1
B. Fulfillment of Primary Objectives	VI-1
C. Division G-2 Comments	VI-3

ANNEXES

A - Intelligence	A-1
B - Downed Aircraft Recovery	B-1
C - Aviation Statistical Summary	C-1
D - Summary of Combat Damage	D-1
E - Abbreviations/Acronyms	E-1
F - Definitions	F-1
G - Map, 1:250,000 Northern Military Region 1 and Southeastern Laos	G-1
H - Map, 1:100,000 LAMSON 719 Area of Operations	H-1

Annexes G & H w/d HQ DA

INDEX OF FIGURES

<u>FIGURE</u>		<u>PAGE</u>
II-1	Task Organization, 101st Aviation Group	II-4
II-2	Additional Division Aviation Committed	II-5
II-3	Total Aircraft Assets, LAMSON 719	II-5
III-1	Phase I: Attack to ALUOI and Consolidation	III-5
III-2	Phase II: Attack to Tchepone and Consolidation	III-6
III-3	Phase III: Extraction	III-7
IV-1	Radio Net Diagram for 159th Avn Bn (ASHB)	IV-54
IV-2	Wire Diagram for 159th Avn Bn (ASHB)	IV-56
IV-3	Maintenance Personnel Status, 159th Avn Bn (ASHB)	IV-59
IV-4	Monthly Flying Hours, CH-47 (Organic)	IV-61
IV-5	Monthly Flying Hours, CH-54A	IV-62
IV-6	Monthly Flying Hours, CH-47 (OPCON)	IV-63
IV-7	159th Avn Bn (ASHB) Support of LAMSON 719	IV-65
IV-8	4/77 ARA Hours Flown By Type Mission, LAMSON 719	IV-71
IV-9	Examples of Typical Missions Flown	IV-72
IV-10	Contribution by 4/77 ARA in LAMSON 719	IV-74
IV-11	Rearm/Refuel Points	IV-78
IV-12	Planned Rearm/Refuel Points	IV-79

<u>FIGURE</u>		<u>PAGE</u>
IV-13	Team Organization (Dong Ha)	IV-80
IV-14	Team Organization (Mai Loc/Lang Con)	IV-81
IV-15	Team Organization (Vandergrift)	IV-82
IV-16	Team Organization (Khe Sanh)	IV-83
IV-17	Equipment List, 10 Point Rapid Refueling System	IV-85
IV-18	Class IIIA, C-130 Receipts, Khe Sanh (17 Feb-8 Mar)	IV-87
IV-19	Request for Air Items	IV-88
IV-20	Recapitulation of Missions by Eagle Dustoff	IV-93
IV-21	Recapitulation of Missions by MEDCOM Dustoff	IV-95
IV-22	Crew Extraction Experience During LAMSON 719	IV-102
IV-23	Aircraft Extracted During LAMSON 719	IV-108
IV-24	Aircraft Maintenance Facilities	IV-111
IV-25	Aircraft Maintenance Activities	IV-112
IV-26	Mission Alignment Structure of 5th Trans Bn	IV-115
IV-27	Aircraft Readiness and Flying Hours by Type Aircraft (Feb - Mar 71)	IV-119
IV-28	Aircraft Readiness and Flying Hours by Unit, Feb 71	IV-120
IV-29	Aircraft Readiness and Flying Hours by Unit, Mar 71	IV-122
IV-30	Recapitulation of Casualties	IV-131

	<u>FIGURE</u>	<u>PAGE</u>
IV-31	101st Abn Div (Ambl) Hours Flown and Accident Rate, 3d Quarter, FY 70 and FY 71	IV-133
IV-32	101st Aviation Group Hours Flown and Accident Rate, 3d Quarter, FY 70 and FY 71	IV-133
IV-33	Khe Sanh Air Facility and Flight Routes	IV-134
IV-34	Aircraft Accidents, LAMSON 719	IV-135
IV-35	Aircraft Incidents, LAMSON 719	IV-138
IV-36	Troop Lift, UH-1H	IV-144
IV-37	AH-1G, Hit versus Lost	IV-147
IV-38	UH-1C, Hit versus Lost	IV-148
IV-39	UH-1H, Hit versus Lost	IV-149
IV-40	CH-47, Hit versus Lost	IV-150
A-1	NE Monsoon Flow	A-2
A-2	Light Southeasterly Flow	A-4
A-3	Southwesterly Flow	A-5
A-4	Aviation Weather Minimums	A-6
A-5	Geography, LAMSON 719	A-8
A-6	Land Forms	A-10
A-7	Vegetation, LAMSON 719	A-11
A-8	Lines of Communication	A-12

<u>FIGURE</u>		<u>PAGE</u>
A-9	Enemy Disposition, 1 February 1971	A-16
A-10	Antiaircraft Defense Deployment	A-18
A-11	Enemy Disposition, Early February 1971	A-19
A-12	Enemy Disposition, Mid-February 1971	A-20
A-13	Enemy Disposition, Mid-February - 1 March 1971	A-22
A-14	Enemy Units Committed Against LAMSON 719, Early March 1971	A-23
A-15	Enemy Disposition, Early March 1971	A-24
A-16	Enemy Disposition, 31 March 1971	A-26
A-17	Characteristics of NVA Antiaircraft Weapons Systems	A-27
C-1	CH-47 Performance Data	C-2
C-2	CH-53 Performance Data	C-4
C-3	CH-54 Performance Data	C-6
C-4	UH-1H Performance Data	C-8
C-5	UH-1C Performance Data	C-10
C-6	AH-1G Performance Data	C-12
C-7	OH-6A Performance Data	C-14
C-8a	Recapitulation of Aircraft Performance, LAMSON 719	C-16
C-8b	Recapitulation of Aircraft Performance, LAMSON 719 plus Operations in Thua Thien and Quang Tri Provinces	C-16

85

<u>FIGURE</u>		<u>PAGE</u>
C-9	Sortie Data (Mission, In Country, Out Country)	C-17
C-10	AH-1G/UH-1C Statistical Data	C-19

CONFIDENTIAL

SECTION I

INTRODUCTION

A. (C) BACKGROUND

In the Fall of 1971, joint USARV, RVNAF and GVN intelligence estimates, coupled with current enemy actions, strongly indicated that the enemy had two primary goals for the approaching dry season in Laos, October 1970 to April 1971. He would conduct an intensified resupply and reinforcement operation in southern Laos and also build up supplies and equipment in northern Military Region I to support large scale operations in that area during the 1971 dry season. December 1970 and January 1971 brought a sharp increase in the amount of supplies moved into the southern Laotian areas known as Base Area 604 (adjacent to Quang Tri). The intelligence community further noted that only a small portion of these supplies had been moved to the south. In previous years the enemy had reached his peak efficiency in February and March in moving supplies to the south. Accordingly, an attack against Base Area 604 and 611 during these months presented the highest probability of inflicting the greatest damage to the enemy. Operation LAMSON 719 was conceived, developed and implemented to react to this intelligence information.

B. (C) OBJECTIVE

Operation LAMSON 719 was designed to interdict the enemy's supply and infiltration routes into southern Laos and northern Military Region I, to destroy his logistic facilities and supplies and to inflict maximum damage to his units. The depth of the operational area was limited to Tchepone in the west, and the width of the area varied from 10-20 kilometers north and south of Route 9 in Laos. I Corps (ARVN) forces, supported and assisted by XXIV Corps, conducted combined air-ground operations to destroy enemy forces and supplies in Base Areas 604 and 611 in Laos. The 101st Airborne Division (Airmobile) mission was to provide support and assistance to US and Vietnamese forces participating in LAMSON 719 operations in western Quang Tri Province and in Laos while continuing the Division's Winter Campaign in Thua Thien Province.

I-1

CONFIDENTIAL

CONFIDENTIAL

88

C. (C) SPECIAL CONSIDERATIONS

1. A XXIV Corps and I Corps planning group was formed at XXIV Corps Headquarters in Da Nang in early January 1971 to develop the operations order for LAMSON 719. Information of the operation was tightly held with just the Commanding General of the 101st Abn Div (Ambl), the Chief of Staff and the G3 initially being familiar with the plan. The G3 participated in preparing the first drafts of the operations order, but it soon became apparent that specialized knowledge in aviation and logistics support from the 101st Abn Div (Ambl) was required. However, the necessary restriction of information to only those division personnel complicated the preparations for LAMSON 719, especially in those areas where long lead-time for planning was necessary.

2. Planning for LAMSON 719 was a combined effort from the beginning, but integration of US commanders and staff members into the I Corps decision-making process was accelerated as Phase I of the operation began. Three weeks after Vietnamese troops crossed the Laotian border, a US-Vietnamese high level staff in support of I Corps was formed at I Corps Headquarters at Khe Sanh, and at that time a combined tactical command post became a reality.

3. The rules of engagement for operations in Laos restricted US helicopters from landing except where inserting or extracting Vietnamese troops and supplies or equipment. US personnel were not permitted to exit the helicopters while in Laos. Thus, advisors and those providing support to I Corps forces did not have access to Vietnamese commanders at the regiment and battalion levels. Support coordination was appreciably restricted.

4. The support provided to I Corps forces in Laos as well as the US forces operating in Quang Tri and Thua Thien Provinces could not have been maintained at the high level it was throughout LAMSON 719 had not USARV devoted the major portion of its assets in support. Damaged or destroyed aircraft were quickly replaced and maintenance support gave priority to those aviation units assigned to or under the operational control of the 101st Abn Div (Ambl).

I-2

CONFIDENTIAL

CONFIDENTIAL

89

D. (C) INTELLIGENCE

1. General

Detailed information regarding weather, terrain, lines of communication and changing enemy disposition as they affected LAMSON 719 may be found in ANNEX A (Intelligence) to this introductory section. Information extracted here is to emphasize certain salient points.

2. Weather

The transitional effects of the monsoon weather in both Laos and South Vietnam had a direct bearing on the conduct and timing of all airmobile operations in support of LAMSON 719. Weather often varied from staging area to pickup zone (PZ) to landing zone (LZ). This same weather variance had an even greater effect on the employment of Air Force TAC air due to the more stringent minimum weather standards required for effective employment.

3. Terrain

The higher elevations of the Annamite Mountain chain in the operational area combined with marginal weather in having a decided effect on airmobile operations. The river valleys, such as the east-west oriented XE PON, became natural flight routes due to navigational requirements in marginal weather. The escarpment running generally east-west approximately two kilometers south of the XE PON River furnished natural objective/staging areas for the thrust toward Tchepone.

4. Lines of Communication

The intensive road improvement effort by the NVA during the Laotian dry season was one of the factors governing the decision to conduct LAMSON 719. The increased vehicular traffic afforded by these improvements allowed a corresponding increase in the infiltration and stockpiling effort; hence, the increased threat in northern Military Region 1.

I-3

CONFIDENTIAL

CONFIDENTIAL

5. Enemy Strengths/Disposition

90

Enemy forces in and near the operational area prior to the initiation of LAMSON 719 on 8 February 1971 were estimated to total 22,000. Of this total, 13,000 were in main line combat units and 9,000 were primarily engaged in supporting, maintaining and defending the extensive infiltration networks. Later, during the peak of enemy activity in early March, it is estimated that the enemy had committed approximately 36,000 troops total to counter LAMSON 719 operations. This figure includes the reversion of the infiltration support troops to their secondary combat role. Of major importance was the increasing density, mobility and sophistication of the antiaircraft defenses used by the NVA to counter the airmobility of LAMSON 719. Particularly effective was the emplacement of these weapons very close to RVNAF forces; this hugging tactic made neutralizing fires difficult if not in some cases impossible. Resupply and extraction missions became extremely hazardous. Detailed discussions of this threat and its effect can be found in Annex A (Intelligence) and throughout this report. In addition LAMSON 719 resulted in the third confirmed appearance of NVA armor against FWMAF and RVNAF. Unlike the first two armor engagements, the NVA used armor in LAMSON 719 in both a fire support role and as part of a coordinated tank/infantry assault, (i. e., the attack on FB 31)

E. (C) XXIV CORPS AND I CORPS CONCEPT OF OPERATIONS

1. I Corps forces conducted all combat operations on the ground in Laos. The maneuver units were provided light and medium artillery support by Vietnamese artillery units. XXIV Corps, assisted by 7th AF, provided support and assistance to I Corps consisting of:

a. Ground and airmobile operations by infantry, armor and airmobile units to secure Quang Tri Province in Vietnam for the staging and supplying of Vietnamese forces.

b. All aerial lift, escort, armed reconnaissance and aerial rocket artillery for I Corps operations in Laos.

c. Heavy artillery at the Vietnamese-Laotian border for I Corps units in range.

CONFIDENTIAL

91

d. Tactical air and heavy bomber strikes throughout the Laotian area of operations.

2. The XXIV Corps plan for LAMSON 719 had four phases. However, the first phase, the securing of western Quang Tri Province by US forces, was renamed DEWEY CANYON II and the last three phases became Phases I, II, and III of I Corps LAMSON 719. The four phases as planned were:

a. Operation DEWEY CANYON II

On D-day, the 1st Brigade, 5th Infantry Division (Mechanized) would attack into the Khe Sanh Plateau to the Laotian border in order to secure Route 9 and seize and secure staging areas and artillery positions to support future phases. The brigade then was to conduct screening operations to the south of Khe Sanh. The 1st ARVN Armored Brigade, following the 1st Brigade, 5th Infantry Division (Mech), would seize and secure objective HAM NGHI (just south of the Khe Sanh airfield) and then screen the northern flank. Meanwhile the 101st Airborne Division (Airmobile) continued operations in Thua Thien Province and prepared to counterattack in the central and eastern DMZ area on order with one brigade of two infantry battalions and two light artillery batteries.

(1) The 1st Brigade, 5th Infantry Division (Mech) consisted of:

- 1st Bn, 11th Inf
- 1st Bn, 77th Armor
- 3d Sqdn, Cav
- 5th Bn, 4th Arty
- 3d Bn, 187th Inf, 101st Abn Div (Ambl) (OPCON)
- 4th Bn, 3d Inf, 23d Inf Div (OPCON)
- 1st Bn, 82d Arty, 23d Inf Div (Attached)

(2) In addition to passing the 3d Battalion (Airmobile), 187th Infantry to the operational control of the 1st Brigade, 5th Infantry Division (Mech), the 101st Airborne Division (Airmobile) was tasked to:

(a) Conduct two artillery raids to forward fire bases in western Thua Thien Province from D-day to D+4.

CONFIDENTIAL

CONFIDENTIAL

92

(b) Provide up to two aerial rocket artillery batteries in general support, reinforcing 5th Battalion, 4th Artillery, 1st Brigade, 5th Infantry Division (Mech).

(c) Coordinate with the 2d Infantry Regiment, 1st ARVN Infantry Division and prepare counterattack plans for defense of the central and eastern DMZ area.

(d) Provide one air cavalry squadron, less one air cavalry troop, in support of the 1st Brigade, 5th Infantry Division (Mech).

(e) Receive operational control of two air cavalry troops provided by the 1st Aviation Brigade; receive operational control of the HAC BAO (Black Panther) Company of the 1st ARVN Infantry Division.

(f) Provide assault, medium and heavy lift helicopter support to include pathfinders to the 1st Brigade, 5th Infantry Division, (Mech) as required on a mission basis.

(g) Provide supervisory personnel and equipment for rigging helicopter external loads.

(h) Operate forward rearm and refuel points as required.

(i) Prepare to accept operational control of all helicopter lift support by non-divisional units.

(j) Provide a control group for Army aviation and Air Force air lift to Khe Sanh.

(k) Provide Engineer Task Force 326 to open Route 9 from the vicinity of Bridge 33 (XD 9242) to Khe Sanh, construct an assault airfield for C-130 aircraft at Khe Sanh, construct fire bases as required and provide combat engineer support to maneuver elements on request.

b. LAMSON 719 - Phase I

I Corps (ARVN) forces were to conduct airmobile and ground attacks in the southern panhandle area of Laos. The main attack would

CONFIDENTIAL

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73
be conducted along Route 9 to Objective ALUOI by the 1st ARVN Airborne Division and the 1st ARVN Armored Brigade with the 7th, 11th and 17th Armored Cavalry Squadrons. One airborne battalion was to conduct an airmobile assault to Objective ALUOI while one airborne brigade occupied the high ground north of Objective ALUOI to establish fire bases. The 1st and 3d Infantry Regiments, 1st ARVN Infantry Division, by a series of battalion-sized airmobile assaults, were to establish fire bases on the high ground south of Route 9 and secure the left (south) flank. The 1st Ranger Group with the 21st, 37th, and 39th Ranger Battalions would conduct airmobile assaults to establish blocking positions and screen the right (north) flank. On order, the 1st Armored Brigade continued to attack west of Objective ALUOI along Route 9 with a third airborne brigade conducting an airmobile assault to Tchepone. The 147th and 258th VNMC Brigades were I Corps reserve at Khe Sanh.

(1) The 1st Brigade, 5th Infantry Division (Mech) continued operations in western Quang Tri Province.

(2) The 101st Airborne Division (Airmobile) continued operations in Thua Thien Province and remained prepared to defend the central and eastern DMZ area in coordination with the 2d Infantry Regiment, 1st ARVN Infantry Division on order. Additionally, the division was tasked to provide up to two aerial rocket artillery batteries as general support, reinforcing the 108th Artillery Group, a XXIV Corps unit; provide one air cavalry squadron with four air cavalry troops in general support of I Corps and XXIV Corps with priority to I Corps, then to 1st Brigade, 5th Infantry Division (Mech); continue aviation lift support with priority to I Corps, then to 1st Brigade, 5th Infantry Division (Mech); and release engineer equipment, particularly bulldozers, to ARVN engineers on order.

c. LAMSON 719 - Phase II

Upon seizure of Tchepone, all forces were to consolidate throughout the area. The 1st ARVN Airborne Division with three brigades of three airborne battalions each would establish multiple small unit blocking positions north and south of Tchepone along Routes 91 and 9F. Detailed search and attack operations would be conducted to destroy enemy forces and supplies. The 1st and 3d

I-7

CONFIDENTIAL

CONFIDENTIAL

94
Infantry Regiments, 1st ARVN Infantry Division were tasked to continue searching the left (south) flank while the 1st ARVN Ranger Group continued blocking and screening operations along the right (north) flank. The 1st Brigade, 5th Infantry Division (Mech) and the 101st Airborne Division (Airmobile) continued their LAMSON 719 - Phase I tasks.

d. LAMSON 719 - Phase III

I Corps forces were to withdraw on order with two options. The first option would task the 1st ARVN Airborne Division and 1st ARVN Armored Brigade to withdraw east along Route 9 to Objective ALUOI in order to support and cover the 1st ARVN Infantry Division forces as they moved southeast and attacked into western Base Area 611. The 1st ARVN Airborne Division would then follow the 1st ARVN Infantry Division forces on order. The 1st ARVN Armored Brigade and the 1st ARVN Ranger Group were to withdraw to Khe Sanh and revert to Corps reserve with the 1st ARVN Ranger Group passing to the operational control of the 1st ARVN Armored Brigade. Meanwhile, the 147th and 258th VNMC Brigades were to attack into the Laotian salient and into Base Area 611. The second option was the same except that after attacking into western Base Area 611, the 1st ARVN Infantry Division forces and the 1st ARVN Airborne Division were to turn north and attack through the Laotian salient. The 1st Brigade, 5th Infantry Division, (Mech) and the 101st Airborne Division (Airmobile) were to continue LAMSON 719 Phase I tasks with the 101st being prepared to conduct a brigade-size attack west of Hue to the Laotian border in coordination with one regiment, 1st ARVN Infantry Division.

F. (C) INITIAL GROUND FORCE TASK ORGANIZATION

I Corps (ARVN)

HQ I Corps
1st ARVN Inf Div (2 Regts with 8 Inf Bns, Div Arty)
1st ARVN Abn Div (3 Bdes with 9 Inf Bns, Div Arty)
1st VNMC Div (3 Bdes with 8 Mar Bns, Div Arty)
1st ARVN Ranger Group (3 Rngr Bns, 1 Bn Arty)
1st ARVN Armd Bde (3 Sqdns)
10th ARVN Engr Gp (2 Engr Bns)

1-8

CONFIDENTIAL

CONFIDENTIAL

95

XXIV Corps (US)

HQ XXIV Corps

101st Abn Div (Ambl) (1 Inf Bn, Cav Sqdn (-), ARA, Avn Gp (-),

DISCOM (-)

23d Inf Div (1 Inf Bn, 1 Cav Sqdn, 1 Bn Arty)

1st Bde, 5th Inf Div (M) (1 Tk Bn, 1 Cav Sqdn, 1 Inf Bn, 1 Bn Arty)

Reserve: 1 Bde (with 2 Inf Bns) plus supporting DS Arty, 101st
Abn Div (Ambl)

G. (C) COMMITMENT OF ADDITIONAL FORCES

DEWEY CANYON II and LAMSON 719 - Phase I went as planned up to the initiation of the 1st ARVN Armored Brigade's attack to Tchepone from Objective ALUOI (last step in Phase I). At this point, CG I Corps determined additional Vietnamese forces would be required to continue the assault to Tchepone. Those forces already deployed in Laos commenced consolidation on 24 February and plans were developed to relieve the 2d Infantry Regiment, 1st ARVN Infantry Division from its area of operation in central and eastern Quang Tri Province in order to commit them in Laos. An additional Vietnamese Marine Brigade (the 369th Marine Brigade) was airlifted from Saigon. In order to release the 2d Infantry Regiment of its responsibilities in Quang Tri Province, additional XXIV Corps forces were deployed to Quang Tri. On 20 February, Headquarters, 3d Brigade, 101st Airborne Division (Airmobile) deployed to central Quang Tri and passed to the operational control of the 1st Brigade, 5th Infantry Division (Mech) until 24 February when they reverted to the operational control of the 101st. Constituting this brigade, the 1st Battalion (Airmobile), 501st Infantry deployed from Thua Thien Province to Quang Tri Province on 24 February, followed a day later by the 2d Battalion (Airmobile), 502d Infantry and the 2d Battalion (Airmobile), 327th Infantry on 28 February. The 101st Airborne Division (Airmobile) then established a tactical command post at Quang Tri Combat Base. It became operational on 1 March. The 23d Infantry Division was tasked to provide a brigade headquarters element, one battalion size infantry unit and necessary support units to include artillery. These elements arrived in Quang Tri Province on 2 March and deployed to the eastern DMZ area on 3 March, passing to the operational control of the 101st. The 1st Brigade, 5th Infantry Division (Mech) also passed to the operational control of the 101st. Thus, as of 3 March, all US ground forces deployed in

I-9

CONFIDENTIAL

CONFIDENTIAL

96

Quang Tri and Thua Thien Provinces were either organic to or under the operational control of the 101st Airborne Division (Airmobile). During the period 10 to 21 March, the 101st Airborne Division (Airmobile) also deployed the 2d Battalion (Airmobile), 506th Infantry and Hqs A and B Companies 1st Battalion (Airmobile), 506th Infantry to Quang Tri Province, while the 2d Battalion(Airmobile), 327th Infantry returned to Thua Thien Province and to the control of the 1st Brigade of the 101st. XXIV Corps forces continued to conduct combat operations in support of LAMSON 719 and the Winter Campaign in this disposition until 8 April when LAMSON 719 was terminated. From 7 to 10 April, all US ground forces in Quang Tri Province redeployed to their normal areas of operation and reverted to the control of their parent organizations.

I-10

CONFIDENTIAL

SECTION II

AVIATION ORGANIZATION

A. (U) GENERAL

The 101st Airborne Division (Airmobile) was charged with the responsibility of providing for the command and control of all aviation elements employed in support of LAMSON 719. Additionally, the 101st Airborne Division (Airmobile) was to accept operational control of all additional aviation support committed in support of the operation.

B. (U) SPECIAL CONSIDERATIONS1. General

In arriving at the optimum task organization to support LAMSON 719, several special considerations or factors influenced the structuring of the aviation task organization.

2. Units to be Supported

Three division equivalents were to be supported. It was envisioned that troop movement and resupply would be accomplished primarily by helicopter.

3. Assets Available

Only those assets organic to the 101st Abn Div (Ambl) were so located as to be capable of supporting LAMSON 719 without displacing from their home station. Additional facilities for aviation units in the Quang Tri area were very limited; therefore units not organic to the Division committed in support of the operation would be required to operate under field conditions.

4. 101st Airborne Division (Airmobile) Operations

The Division was expected to commit a maximum number of aviation assets in support of the operation and concurrently perform

assigned missions in current area of operation.

5. Impact of Drawdown on USARV Assets

All aviation units were fully committed in their assigned areas of operation. The diversion of assets to support LAMSON 719 would adversely affect operations elsewhere in the theater.

6. Air Cavalry Assets

The area of operation and environment for LAMSON 719 dictated maximum use of air cavalry assets; however, the area of operation and enemy situation in the area assigned to the 101st Abn Div (Ambl) also dictated maximum use of air cavalry.

7. Heavy Lift Requirements

Projected heavy lift requirements, particularly those requiring CH-54 aircraft, by far exceeded the organic capability of the 101st Abn Div (Ambl).

8. Distance

Troop lift and resupply operations were to be conducted over extended distances. The one-way distance from Khe Sanh to Tchepone is 53 kilometers.

C. (U) TASK ORGANIZATION

1. Assault Helicopter Battalions

Four assault helicopter battalions with 10 assault companies and four aerial weapons companies were included in the task organization. Two additional assault helicopter companies, 116th and 282d, were added to the task organization for the periods 5 - 7 March and 22 - 24 March.

2. Assault Support Helicopter Battalion

One assault support helicopter battalion consisting of five medium (CH-47) lift companies, a heavy (CH-54) lift company and one

heavy (CH-53) lift squadron was to fulfill all heavy requirements.

3. Air Cavalry

Two additional air cavalry troops were placed OPCON to the 2d Squadron, 17th Cavalry.

4. Aerial Rocket Artillery

Aerial Rocket Artillery (ARA) support was to be provided by the 4th Battalion (Aerial Artillery), 77th Artillery (Airmobile).

5. Command

All assault and assault support units were commanded by Commanding Officer, 101st Aviation Group. All air cavalry and ARA units were commanded by Commanding Officer, 2/17 and 4/77 ARA Bn respectively.

6. Unit Designations and Aircraft Authorizations

(See Figure II-1) Units designated with an asterisk were OPCON units. All others are organic to the 101st Abn Div (Ambl).

101st AHB

	A/101	(20 UH-1H)
	B/101	(20 UH-1H)
	C/101	(20 UH-1H)
	D/101	(12 AH-1G)
*	235 AWC	(21 AH-1G, 3 UH-1H)

158th AHB

	A/158	(20 UH-1H)
	B/158	(20 UH-1H)
	C/158	(20 UH-1H)
	D/158	(12 AH-1G)
*	D/227	(12 AH-1G)

14th CAB

*	71 Co	(23 UH-1H, 8 UH-1C)
*	174 Co	(23 UH-1H, 8 UH-1C)
*	116 Co	(23 UH-1H, 8 UH-1C) (5-7, 22-24 March)

223d CAB

*	48 Co	(23 UH-1H, 8 UH-1C)
*	173 Co	(23 UH-1H, 8 UH-1C)
*	282 Co	(23 UH-1H, 8 UH-1C) (5-7, 22-24 March)
*	238 Co	(12 UH-1C)

159th ASHB

	A/159	(16 CH-47)
	B/159	(16 CH-47)
	C/159	(16 CH-47)
	478 Co	(10 CH-54)
*	179 Co	(16 CH-47)
*	132 Co	(16 CH-47)
*	463 Sqdn	(16 CH-53)

163d GS Co (10 UH-1H, 12 OH-6A)

* OPCON to 101st Avn Div (Ambl)

FIGURE II-1 (U) Task Organization, 101st Aviation Group (U)

101

2d Squadron, 17th Cavalry

A 2/17 (8 UH-1H, 9 AH-1G, 10 OH-6)
 C 2/17 (8 UH-1H, 9 AH-1G, 10 OH-6)
 * B 7/1 (8 UH-1H, 9 AH-1G, 10 OH-6)
 * C 7/17 (8 UH-1H, 9 AH-1G, 10 OH-6)

4th Bn (Aer Arty), 77th Arty

Btry (12 AH-1G)
 Btry (12 AH-1G)

* OPCON to 101st Abn Div (Ambl)

FIGURE II-2 (U) Additional Division Aviation Committed (U)

OH-58	5
OH-6A	59
UH-1C	60
UH-1H	312
AH-1G	117
CH-47	80
CH-53	16
CH-54	<u>10</u>
TOTAL	659

(Totals reflect command and control aircraft from battalion headquarters not elsewhere indicated)

FIGURE II-3 (U) Total Aircraft Assets Available to Support LAMSON 719 (U)

D. (U) CO, 101ST AVIATION GROUP COMMENTS

1. Adequacy of Task Organization to Support LAMSON 719

a. UH-1C Aircraft

The major shortfall in aviation support was in the gunship category. The UH-1C gunship was not capable of performing satisfactorily in the LAMSON 719 environment. Performance limitations and the hostile antiaircraft environment encountered limited the effectiveness of the 60 UH-1C aircraft assigned in support of the operation. The 235 AWC and D/277 were added to the task organization to compensate for the ineffectiveness of the UH-1C.

b. Gunships for Escort

All cross border aircraft operations required gunship escort. CH-47 and CH-54 resupply missions used the assets of one aerial weapons company daily. Additional gunship requirements emanated from medical evacuation missions. The foregoing requirements were in addition to continuing requirement to provide gunships for the many combat assaults that were conducted.

103

CONFIDENTIAL

SECTION III

CHRONOLOGY OF OPERATIONS IN LAOS

A. (C) ATTACK TO ALUOI AND CONSOLIDATION

8-10 February

The attack into Laos was initiated on 8 Feb from bases established on the Khe Sanh Plain. The 1st Armored Brigade Task Force crossed the border at 1000 hours and advanced 9 kilometers westward along Route 9 the first day. Three battalions of the 3d Regt, 1st ARVN Inf Div air assaulted into LZ's south of Route 9 (LZ's HOTEL and BLUE). North of Route 9, two battalions of the 1st ARVN Abn Div air assaulted to objectives 30 and 31, and one ranger battalion landed in the vicinity of RANGER SOUTH LZ. Additionally, 105mm howitzer batteries were air landed on LZ HOTEL and objectives 30 and 31 on 8 Feb. On 9 Feb all air moves were cancelled due to adverse weather. The armored TF moved forward 2 kilometers. On 10 Feb, the 1st ARVN Abn Div air assaulted a battalion into objective ALUOI; the armored TF linked up with the battalion at 1555 hours. Also the 1st ARVN Inf Div landed a battalion on LZ DELTA. The initial objectives had been seized.

11-13 February

During this period the armored TF consolidated its position around objective ALUOI. The 1st Regt, 1st ARVN Inf Div inserted two battalions on LZ DON and one on DELTA. A ranger battalion air assaulted to RANGER NORTH LZ. Additional forces, artillery and supplies were air lifted into objective ALUOI and other established LZ's. An airborne battalion was inserted north of objective 31 on 13 Feb as the forces flanking the armor drive moved abreast of objective ALUOI.

14-18 February

With the armor column making no further progress to the west, the 1st ARVN Inf Div turned south expanding its search for enemy supplies and facilities. Elements of the 3d Regt, 1st ARVN Inf Div and accom-

III-1

CONFIDENTIAL

CONFIDENTIAL

104

panying artillery moved to fire base HOTEL II and LZ GRASS. Attempts to insert a battalion on LZ GREEN were broken off because of intense enemy fire. Forces in the vicinity of LZ GRASS made increasing contacts with the enemy.

19-22 February

The northern flank of the penetration came under heavy attack with the enemy successively concentrating his forces on the RANGER LZ's and airborne objectives. Resupply to these locations was limited by intense enemy fire on the LZ's. On 20 Feb the 39th Ranger Battalion positions on RANGER NORTH were penetrated by the NVA. Elements of the battalion were able to reach RANGER SOUTH the next day. RANGER SOUTH and objective 31 then came under increasing enemy pressure.

23 February-2 March

During the period, preparations were made to regain the initiative and continue the drive west. 1st ARVN Inf Div elements were repositioned north and west. 3d Regt forces were moved from FB HOTEL II to FB DELTA I and from LZ GREEN to LZ BROWN. On 25 Feb, the ranger battalions were extracted. Objective 31 came under heavy attack which included the use of tanks by the enemy. The 1st Armored TF attacked north to relieve the airborne positions on objective 31. The 1st ARVN Inf Div forces on the extreme southern flank continued to be under heavy pressure until withdrawn on 1 March. An airborne battalion was inserted at FB ALPHA to secure Route 9 and hold open the I Corps penetration into Laos.

B. (C) ATTACK TO TCHEPONE AND CONSOLIDATION

3-6 March

The drive to Tchepone was accomplished in a series of airmobile assaults by the 1st ARVN Inf Div westward along the escarpment which overlooks Route 9. Division forces were released for this operation by inserting two brigades of the 1st Vietnamese Marine Division, one in the vicinity of FB HOTEL and the other around FB DELTA. Additionally, the 2d Regt, 1st ARVN Inf Div, with 5 battalions was made available from

III-2

CONFIDENTIAL

CONFIDENTIAL

105

eastern Quang Tri Province (relieved by the 3d Bde, 101st Abn Div (Ambl) and the 11th Bde, 23 Inf Div). The 1st ARVN Inf Div units air assaulted successively into LZ's LOLO, LIZ, and FB SOPHIA WEST. By 5 March, the 3d Regt had occupied FB DELTA I and LZ BROWN and the 1st Regt was conducting operations in the vicinity of LZ's LIZ and LOLO. The 2d Regt had landed at FB SOPHIA WEST and was moving westward along the escarpment. On 6 March, 2 battalions air assaulted into LZ HOPE, north of Tchepone. These units then attacked south and west occupying the town. During this period the airborne division and the armored task force operated north and east of objective ALUOI, and FB BRAVO was opened by the airborne division.

7-10 March

During this period the forces which had been operating from LZ HOPE into Tchepone linked up with elements to the south on the escarpment. As enemy pressure began to build in the Tchepone area, all friendly elements withdrew south of Route 9 and began moving toward SOPHIA WEST.

C. (C) EXTRACTION

11-14 March

The withdrawal from forward positions in the vicinity of Tchepone and FB SOPHIA WEST was accomplished overland to the vicinity of LZ LIZ. On 11 March, two battalions and the 2d Regt CP, 1st ARVN Inf Div were extracted to FB SOPHIA EAST and subsequently to FB DELTA I, with two additional battalions moving the next day to the vicinity of LZ BROWN. The 1st Regt continued operations south and west of FB LOLO and the 3d Regt SW of FB DELTA I and LZ BROWN. The 1st VNMC Div conducted operations with two brigades in the areas of LZ DON, FB DELTA, and FB HOTEL. Resupply to all units was curtailed because of indirect and small arms fire on the LZs.

15-18 March

Increased enemy pressure and lack of success in resupplying or conducting medical evacuation at FB LOLO forced the defenders to abandon the base and move overland to the east. By the end of the 16th,

III-3

CONFIDENTIAL

CONFIDENTIAL

106

the 3d Regt, less 1 battalion, had been extracted by air from Laos. On the 18th, the 1st Regt was extracted from multiple LZ's around FB DELTA I and FB SOPHIA EAST. The battalions had been in continuous contact for several days and were forced to move to new pickup zones on several occasions in order to break contact with the enemy. Extractions were completed only after intensive air, artillery, and aerial rocket artillery preparation and under the protection of air cover.

19-22 March

With the majority of the friendly forces off the escarpment west of Obj ALUOI, the evacuation of Obj ALUOI and elements of the airborne division commenced. By the end of the 21st, the 1st ARVN Inf Div had been completely withdrawn from Laos, with the extraction by air of the 2d Regt. As before, the units were forced to move overland, often at night, in order to break contact and make the extraction feasible. Elements of the airborne division were lifted out of Laos under similar circumstances. Meanwhile, the armor column had run into resistance on its push toward TABAT. It initially moved to FB ALPHA on 19 March with no difficulty but ran into enemy resistance and road blocks east of FB BRAVO.

23 March - 6 April

On 23 March the armor column crossed the border and one VNMC brigade was extracted from the vicinity of FB DELTA. The following day the last friendly forces left Laos with the extraction of all elements on FB HOTEL, although two reconnaissance teams were subsequently inserted on FB HOTEL for two additional days. Subsequently, raids into Laos were planned. The first was scheduled for 28 March but was postponed because of submarginal weather and relocated because of enemy ground fire in the objective area. On 31 March, 300 men of the 1st ARVN Inf Div Hac Bao (Black Panther) and division recon companies were inserted deep in Base Area 611. They were extracted the next day with virtually no casualties. A second raid was conducted on 6 April with 150 men successfully inserted and extracted on the same day in the Laotian salient.

III-4

CONFIDENTIAL

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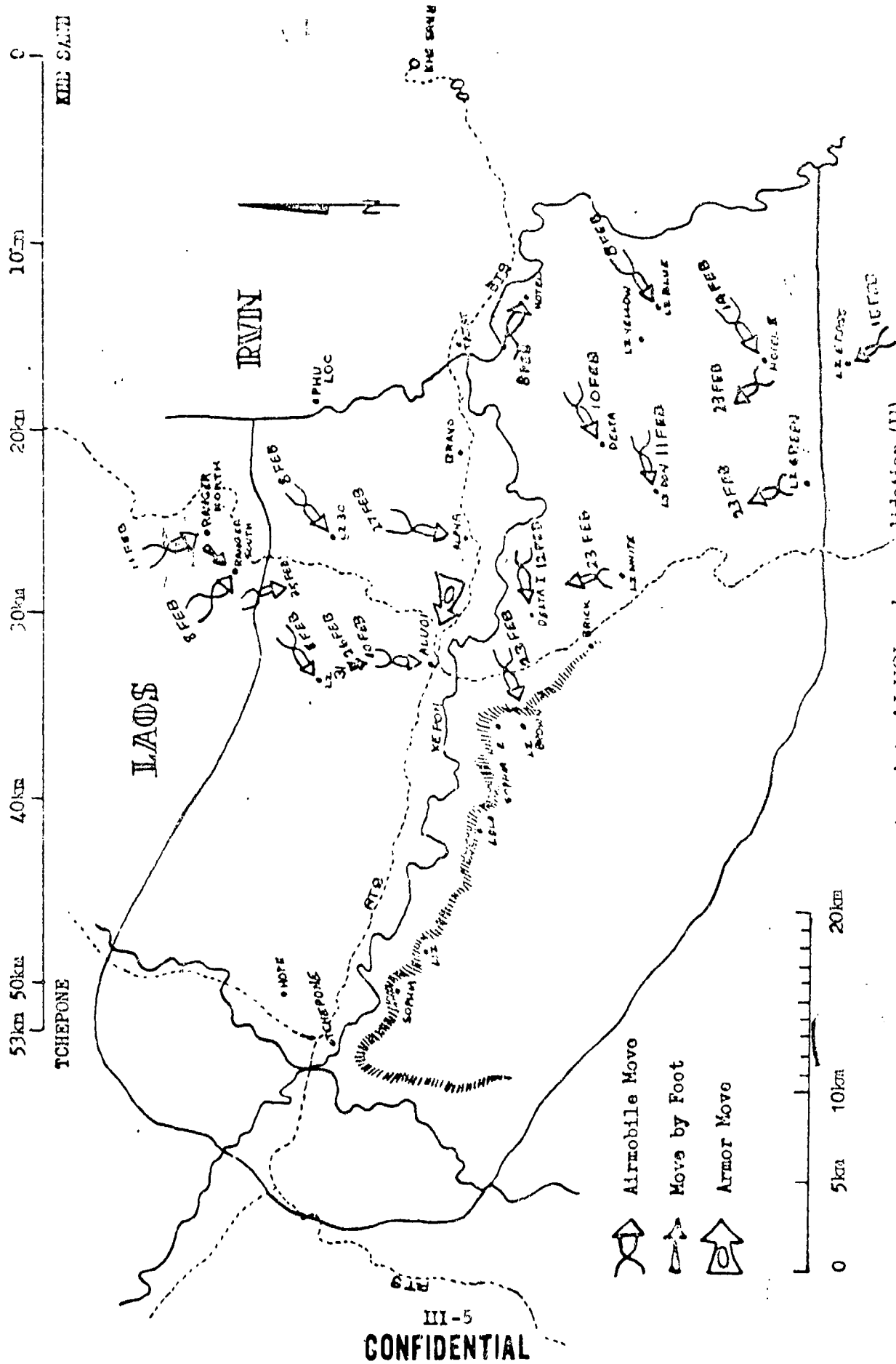


Figure III-1 (C). Phase I: Attack to ALUOI and consolidation (U)

III-5
CONFIDENTIAL

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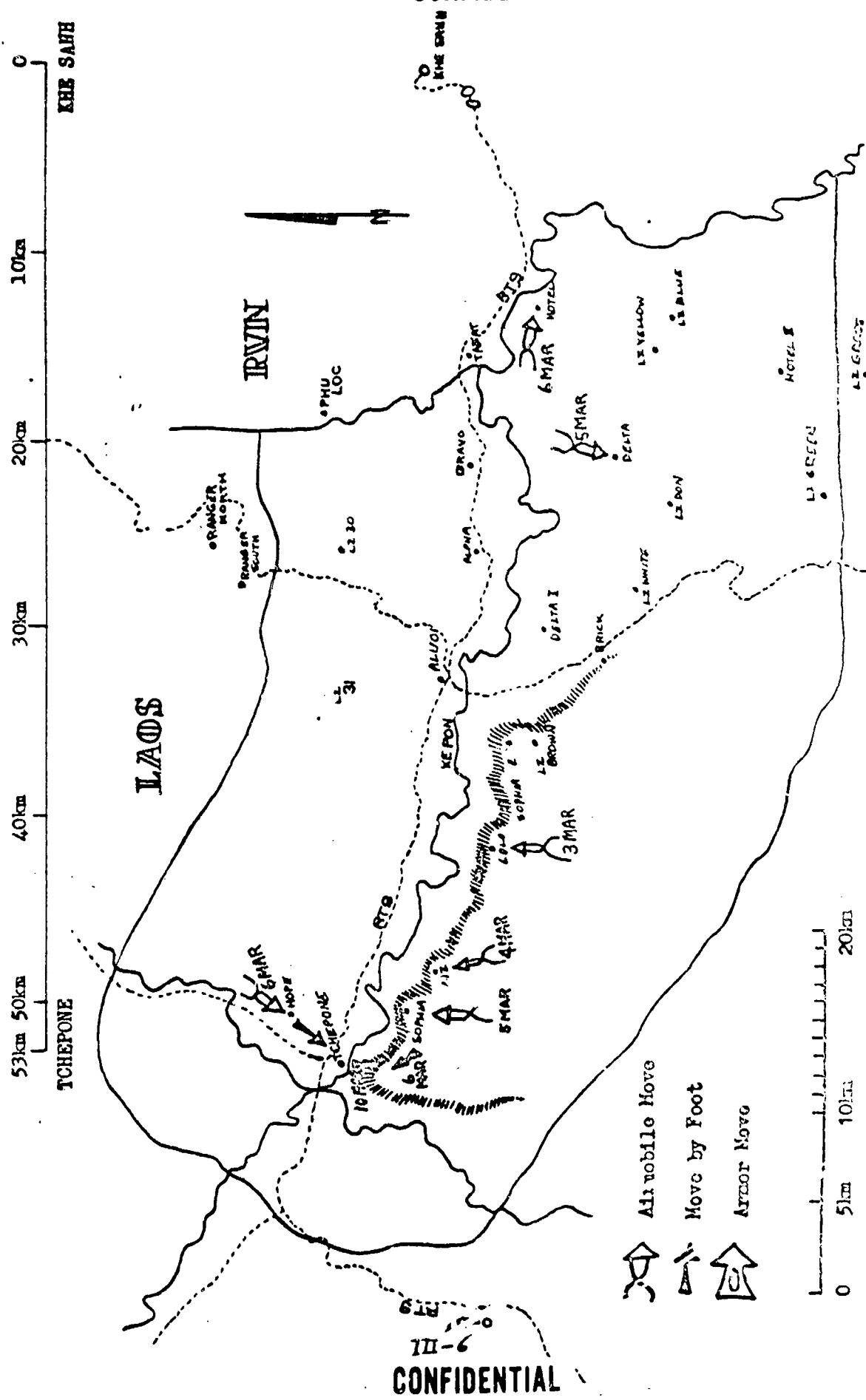


Figure III-2 (C). Phase II: Attack to Tchepone and consolidation (U)

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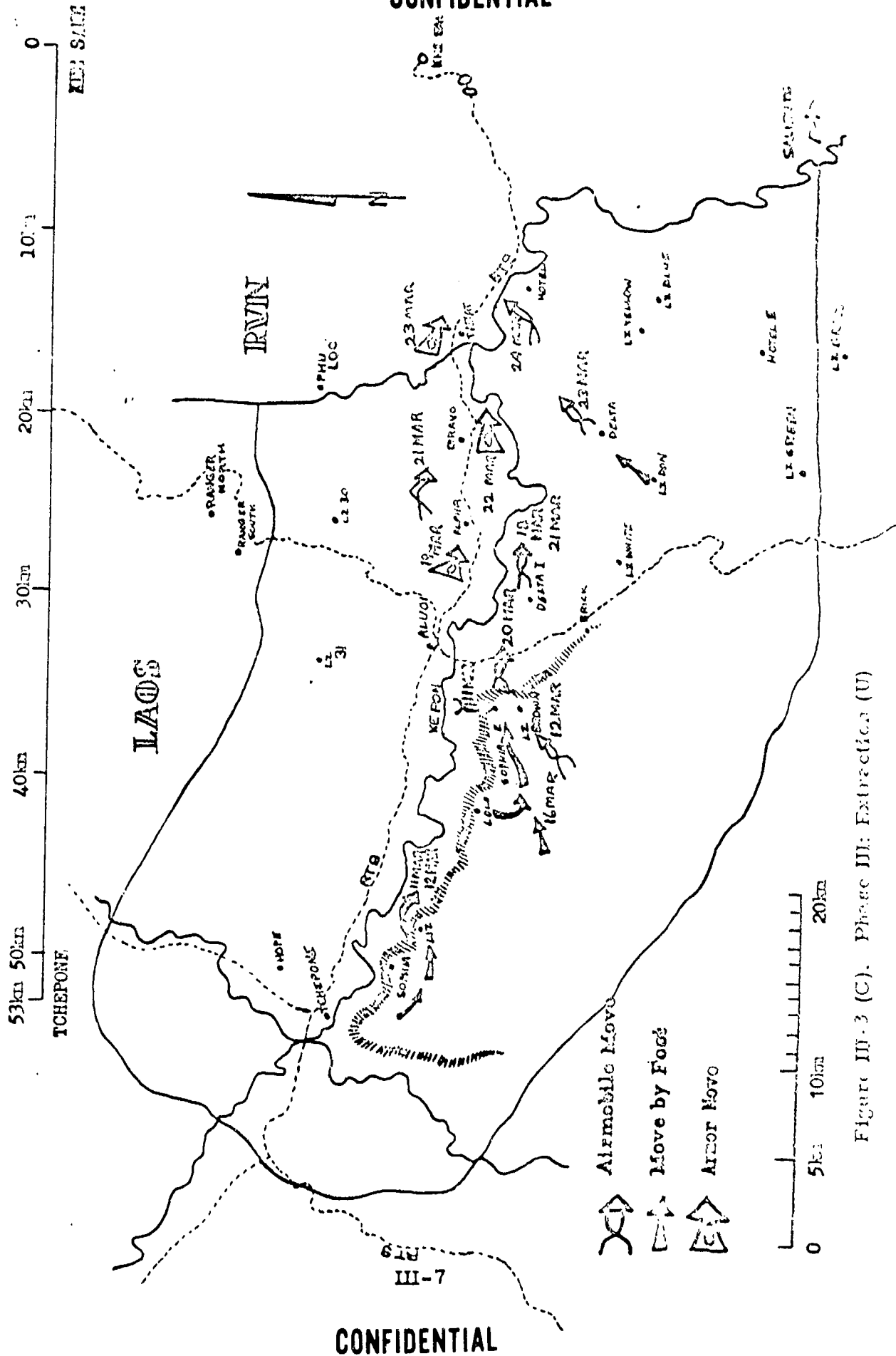


Figure III-3 (C). Phase III: Extraction (U)

CONFIDENTIAL

SECTION IV

AIRMOBILE OPERATIONS IN LAOS

A. (U) CONCEPT OF OPERATIONS

1. Unit Alignment

An Assault Helicopter Battalion was placed in direct support of each major ARVN unit. This positive orientation was designed to facilitate planning, coordination, and execution of combat operations while simultaneously realizing an increasing degree of confidence and professionalism between the US helicopter battalions and the ARVN units they were supporting. The 223d CAB was placed in direct support of the 1st ARVN Inf Div. All airmobile assaults conducted by the 1st ARVN Inf Div were controlled by the 223d CAB. Additionally, all UH-1H general support aircraft required by the 1st ARVN Inf Div were provided by the 223d CAB. The 158th AHB was placed in direct support of the 1st ARVN Airborne Division and the 1st ARVN Ranger Group. All combat assault and general aviation support requirements for these two units were controlled by the 158th AHB. The 14th CAB was placed in direct support of the VNMC Division and controlled all combat assaults and general support missions for the division.

2. Aircraft Allocation

Based on mission requirements, the assets of the twelve assault helicopter companies and four aerial weapons companies were allocated to the three assault helicopter battalions. Additionally, assets were reallocated during the day as requirements changed. The only constant in aircraft allocation was the direct support battalion headquarters which habitually worked with the designated ARVN units. Aviation companies of the various aviation battalions performed well, regardless of the controlling battalion headquarters.

3. Heavy Lift Support

The Commanding Officer, 159th ASHB was charged with the responsibility for coordinating and performing all heavy lift missions. A liaison officer from the 159th ASHB was assigned to each major ARVN unit. Additionally, a pathfinder team from the 101st Aviation Group was placed at all resupply bases in South Vietnam.

4. Planning Conferences

//2

All combat assaults and resupply missions were to be preceded by detailed planning conferences. As the situation developed, the planned coordination conferences became a tactical necessity. The desire, willingness and professionalism of ARVN planners and commanders greatly enhanced helicopter operations during LAMSON 719. All US aviation unit commanders to company level had served at least one previous tour in Vietnam. The US/ARVN experience level was evident during planning sessions. The success of airmobile operations in Laos can largely be attributed to the detailed planning preceded each operation.

5. Mission Assignment

Liaison officers drawn from the helicopter battalions supporting each major ARVN unit provided a direct line of communication from the supported unit to the 101st Aviation Group. Through this channel all requests for aircraft support for the succeeding day's operation were passed to this controlling headquarters. Mission requests were consolidated at 101st Aviation Group and priorities of support and allocation of resources were referred to I Corps for decision. A detailed discussion pertaining to allocation of resources is presented in Section IV-C.

6. CO, 101st Aviation Group Comments

During the planning and preparatory phase prior to the beginning of LAMSON 719, it was envisioned that multiple combat assaults and resupply operations would occur daily throughout the operation. Therefore, planning, execution and allocation of resources would necessarily remain flexible to insure responsiveness to the many requirements. Changing allocation of resources to meet existing requirements was the responsibility of the Operations Section, 101st Aviation Group. Through multiple means of communication to include the assigned liaison officer, the Operations Section, 101st Aviation Group monitored operations throughout the LAMSON 719 area of operations. Additional requirements for aircraft were frequently anticipated in advance of an actual request. This control center maximized utilization and responsiveness of aviation assets to changing mission requirements. The established concepts for conducting combat assaults were followed throughout LAMSON 719. These concepts proved sound. Particularly rewarding was the confidence and professionalism that developed between the ARVN units and supporting aviation units.

B. (U) COMMAND AND CONTROL1. General

Command and control of airmobile operations in Laos generally paralleled the procedures employed in Vietnam; however, there were several significant differences.

a. In-country Command and Control

In Vietnam, immediate control of an airmobile assault is exercised by the Air Mission Command (AMC) and the Airmobile Task Force Commander (AMTFC). The AMC is the senior aviation unit commander and is responsible for command and control of the aviation assets. The AMTFC is the designated ground commander. During the combat assault, the AMC and the AMTFC are located in the Command and Control aircraft and position themselves where both can best control the operation. The AMTFC has the "go" or "no go" power of decision in a United States Army operation, although he gives great weight to the recommendation of the supporting Air Mission Commander.

b. Out-of-country Command and Control

In Laos, during airmobile operations conducted in support of LAMSON 719, the ground forces and the Ground Commander were Vietnamese, while the Air Mission Commander and the supporting aviation crews and assets providing airmobility were American. There was no Airmobile Task Force Commander in the sense used by the United States Army. The Ground Commander and the Air Mission Commander were coordinate and coequal, each responsible for a separate national force. Each national force had a different function. Therefore, "go" or "no go" decisions were arrived at jointly through discussion, cooperation, and coordination.

2. Commander Structure

The AMC and the Ground Commander directly controlled all combat assaults. Usually the aviation battalion commander performed

114
as AMC and appropriate ARVN regimental commander performed as Ground Commander. In order to comprehend the complete functioning of elements exercising command and control during the combat assaults conducted in Laos the entire chain of command must be examined.

a. CG - I Corps

The CG of I Corps approved all major combat assaults. Additionally, aviation assets to be used during the assault were also subject to his approval. The CG was normally located at I Corps Forward Command Post, Khe Sanh, and was generally available to render decisions on matters as they occurred during the day.

b. Division Commanders

ARVN division commanders normally participated in pre-assault planning and briefings. All combat assaults were subject to approval by the appropriate division commander. During the conduct of combat assaults, division commanders were normally present in their command post and were available to consider matters referred to them for decision.

c. ADC(O), 101st Abn Div (Ambl)

The ADC(O), 101st Abn Div (Ambl) was likewise present in the LAMSON 719 area of operations. The ADC(O) was the senior decisionmaker and decision expediter regarding US airmobile support in Laos. Major decision points related to US aviation support were referred to the ADC(O). Additionally, the ADC(O) would forward to I Corps these urgent matters requiring consideration and decision by ARVN.

d. Commanding Officer, 101st Aviation Group

As the senior US aviation unit commander in Laos, CO, 101st Aviation Group exercised command and control of all aviation units participating in support of LAMSON 719. The forward command post of the 101st Aviation Group was located at Khe Sanh throughout the period. An augmented operations section with multiple means of

115

communication enabled CO, 101st Aviation Group to monitor simultaneously all air operations occurring in Laos. During all combat assaults either the ADC(O) or CO, 101st Aviation Group exercised direct supervision of the operations.

e. Air Mission Commander/Ground Commander

The Air Mission Commander and Ground Commander controlled all combat assaults as previously discussed.

C. (U) ALLOCATION OF RESOURCES

1. Request for Aviation Support

As previously discussed, the liaison officers from the 101st Aviation Group to the major RVNAF units compiled and submitted their units' requests for aviation support. These requests were normally reviewed by the supporting aviation battalion commander prior to submission. This initial review greatly expedited consolidation of requests and preparation of a recommended allocation of aircraft for submission to I Corps for approval.

2. Action by 101st Aviation Group

Commanding Officer, 101st Aviation Group, attended the 1730 hours command briefing at Headquarters, I Corps. During this briefing the subsequent day's operations were discussed. CG, I Corps, indicated the relative priority of the following day's operations. Based on the guidance and priorities presented at the 1730 hours briefing, aircraft allocations to support the following day's missions were established and disseminated to all aviation units. Aircraft allocations were reviewed by CG, I Corps, each morning at the 0815 hours command briefing. CO, 101st Aviation Group, briefed the CG, I Corps, each morning on the missions to be accomplished, relative priority and aircraft allocated for each mission. CG, I Corps, approval of aircraft assignment constituted formal approval of allocation of aviation resources by the Corps Commander. It is significant that CG, I Corps, did not at any time during LAMSON 719 change the allocation of aviation resources as recommended by CO, 101st Aviation Group.

3. Factors Influencing Recommended Allocation of Resources

a. Mission Priority

As previously indicated the relative mission priority was established by CG, I Corps, at 1730 hours command briefing.

b. Review of Tasks to be Accomplished

Throughout LAMSON 719 all tasks were carefully reviewed

each night to determine the optimum number of aircraft that should be allocated for each mission. At 2000 hours each night, ADC(O), 101st Abn Div (Ambl), was briefed in detail on that day's operations and the planned operations for the following day. In attendance at the 2000 hours briefing were CO, 101st Aviation Group, and key group staff officers; battalion commanders, or S-3 of all aviation battalions; CO or S-3, 2/17 Air Cavalry Squadron; CO, 4/77 ARA Bn (Fwd); and representatives from supporting units. All aviation battalion commanders presented their plans for the following day's operation and aircraft resources required to perform the missions. This intensive review of daily operations and plans for the next day provided a sound basis for allocation of aviation resources for operations to be conducted the following day.

c. Principles Influencing Aircraft Allocation

(1) Maximum Combat Power to be Landed in Minimum Time

Paramount consideration was given to rapidly landing the maximum in combat power in minimum time. Particularly desirable was to insure that sufficient aircraft were allocated so that the combat assault of a battalion size unit could be completed before the aircraft were required to refuel.

(2) Allocation of Heavy Lift Assets

Heavy lift assets were so programed as to insure completion of tactical movements in minimum time and in consonance with the desires of the ground commander.

(3) Frequent Re-allocation of Assets

The flexibility inherent in airmobile operation was fully exercised during LAMSON 719. UH-1H lift companies were expeditiously switched from the control of one helicopter battalion to another in order to achieve maximum utilization of assets and to provide desired concentration of aircraft to support designated missions. The ability to shift assets rapidly from support of one RVNAF division to another was particularly noteworthy.

118

(4) General Support Requirements

Daily gunship requirements for resupply escort, medical evacuation missions, downed aircrew and aircraft recovery severely taxed available gunship assets. The general support gunship requirements competed with gunship requirements allocated in support of combat assaults.

4. CO, 101st Aviation Group Comments

Allocation of aviation resources was one of the major tasks to be accomplished daily during LAMSON 719. Rarely were there sufficient assets to provide all units with the aircraft in the numbers requested. However, the shortage of assets was offset by rapid and efficient re-allocation during the day to insure mission accomplishment in the priority established by the I Corps Commander. Initially, senior RVNAF commanders did not appear to fully understand how aircraft were allocated and why their unit did not receive all the aircraft they requested each day. The ADC(O), 101st Abn Div (Ambl), through a series of personal visits to senior RVNAF commanders and through explanations and observations presented at the I Corps Commander's briefings eliminated points of misunderstanding.

D. (U) AIR CAVALRY OPERATIONS

1. Missions

The 2d Squadron, 17th Cavalry was tasked to locate and destroy antiaircraft weapons, to locate enemy concentration, to provide reconnaissance and security for allied units participating in LAMSON 719 and to accomplish downed aircrew recovery in Laos. From these tasks the following missions were derived: long range reconnaissance, security missions, and reconnaissance for combat assaults and extractions.

2. Organization for Combat

a. The 2d Squadron, 17th Cavalry was organized with the following air cavalry troops: A/2/17 Cav, C/2/17 Cav, B/7/1 Cav (OPCON), C/7/17 Cav (OPCON). These air cavalry troops were complemented by one dismounted ground cavalry troop (D/2/17 Cav) which was restricted to employment inside RVN. The HAC BAO Company, 1st ARVN Inf Div, was also OPCON to the 2d Squadron, 17th Cavalry for the security and/or extraction of downed aircraft crews in Laos.

b. The 2d Squadron, 17th Cavalry crossed the Laotian border on 8 Feb 71 in direct support of the ARVN Corps in Laos, and general support of XXIV Corps. C/2/17 Cav and C/7/17 Cav supported the Ranger, Airborne and Armored units astride and to the north of Route 9. A/2/17 Cav and B/7/1 Cav supported the 1st ARVN Inf Div and the VNMC units south of Route 9. The HAC BAO Co was used as required in the LAMSON 719 area of operation. The final decisions regarding the allocation of air cavalry resources were made by CG, I Corps.

3. Reconnaissance and Target Acquisition

a. The 2/17 Cav was permitted to cross the border on 8 Feb 71 only after RVNAF ground forces initiated operations in Laos. This constraint precluded early reconnaissance of NVA antiaircraft installations. The Cav preceded the initial airmobile assault into Laos by approximately two hours and had only about one hour to conduct reconnaissance operations and screen landing zones prior to the combat assaults. Once the

120
initial troop insertions were complete, the Cav moved well in advance of the ground forces and began reconnaissance 8-15 km to their front and flanks. Emphasis was placed on areas where future troop insertions were to be made, and on locating and destroying enemy antiaircraft weapons. Storage areas, personnel, equipment and other targets of opportunity were located and engaged, and the first few days of the operation found the Cav in a reconnaissance role. As the ground operation in Laos continued, the mission of the Cav changed from strictly reconnaissance to security operations. Demand for gunships was heavy, and the Cav began to work closer to friendly units as they made more contact with NVA forces. The Cav emphasis shifted from locating and destroying antiaircraft weapons and storage areas to locating enemy troop concentrations and indirect fire weapons that posed an immediate threat to ARVN forces. Cav gunships began providing close fire support at the expense of deeper reconnaissance.

b. With all Cav troops working in close proximity to ground elements, the overall intelligence gathering capability of the Cav was diminished. Immediate threats to ARVN ground forces and supporting aircraft were being detected, but NVA troop concentrations and antiaircraft coming into the operational area from a distance were experiencing relative freedom of movement. At this time the Cav Squadron Commander recommended to the I Corps Commander that two troops be placed in direct support of ground forces, and that the other two work in general support well in front of and to the flanks of ARVN forces. This recommendation was accepted as a balance to satisfy the competing requirements of security and reconnaissance.

4. Support of Combat Assaults

It became apparent during the early phases of LAMSON 719, that massive fire support in the form of TAC air, ARA and Cav gunships would have to be available in order to run combat assaults without losing excessive numbers of lift ships. Air cav was used in the traditional cavalry role of reconnaissance and security. Upon receiving the mission to support a combat assault or extraction, one to four air cav troops would be tasked to perform the cavalry portion of the operation. The air cavalry would precede the lift to the operational area, looking

for relatively safe routes, a primary landing zone, and alternate landing zones. The routes in and out would be reconnoitered and recommendations would be passed to the Air Mission and Ground Commanders prior to the actual insertion/extraction. The Cav worked in conjunction with the ARA and tube artillery, when available, to prepare the objective area. Normally the Cav command and control aircraft on station would assume control of the fire support assets, employing them against targets detected during the Cav reconnaissance. Immediately prior to an actual insertion/extraction the Cav team on station would make a final check of the landing area, and make recommendations to the Air Mission Commander as to whether the mission should continue or whether additional preparation was required. Once a lift began, the Air Mission Commander assumed control of the ARA and the FAC who was controlling the smoke, and the Cav would move out and screen away from the landing zone. TAC air and Cav gunships would then attack known or suspected antiaircraft weapons in the general area, clearing as wide an area along approach and departure routes as possible. Cav aircraft were also prepared to protect and extract downed aircrews in the vicinity of the landing zone if required.

5. Antiaircraft Engagements

In all cases where antiaircraft weapons were encountered, the 2/17 Cav requested TAC air, since the USAF has the standoff range and the fire power to engage antiaircraft weapons at a more acceptable risk level than does the Cav with organic gunships. When the Air Force had higher priority missions and was not available for such support, organic aircraft on occasion engaged and destroyed antiaircraft weapons as large as 37mm. However, 23mm and larger were usually not engaged but marked for a FAC. Antiaircraft engagement tactics varied from troop to troop, but generally the concept was to use as many gunships as possible, attacking simultaneously from different directions. If, as in the first month, OH-6A's were with the team, they were put in orbit out of effective range until the gun was destroyed. The most difficult aspect of engaging NVA antiaircraft weapons was to pinpoint the exact location of the weapon. The NVA has excellent fire discipline and used mutually supporting positions, firing short bursts as helicopters flew through their kill zones. Once a weapon was pinpointed, the AH-1G had range stand-off advantage over the 12.7mm and 14.5mm. Flechettes, HE and WP

122

rockets and the XM-35 20mm gun if available were all used in engagement. The most significant antiaircraft threat faced by the Cav was the 12.7mm heavy machine gun. The NVA employed large numbers of these weapons, and located them so as to be mutually supporting along likely helicopter approach routes. As far as can be determined the Cav lost no aircraft to weapons larger than 12.7mm, although several hits were recorded from 37mm airbursts. To counter the 12.7mm threat and still not become unacceptably vulnerable to larger caliber fire, most Cav teams operated at 3500 feet AGL to 5000 feet AGL, except for one AH-1G operating low and fast to detect targets.

6. Tank Engagement

a. During LAMSON 719, the 2/17 Cav encountered PT-76 tanks, a target new to the squadron. Initially HEAT Rockets were not available; engagement was made with ordnance on hand. Upon sighting a tank the AH-1G's would initiate contact at maximum range with 2.75 flechette rockets. This served to wipe personnel off the vehicles and their immediate proximity. As the gun run continued, the AH-1G pilots would begin firing a mixture of HE and WP rockets, breaking off the run at approximately 1000 meters.

b. When available, the XM-35 20mm cannon was used. This weapon is extremely accurate, and affords a standoff distance of 2000 to 2500 meters; however, adequate ammunition is not available for this weapon. The USAF armor piercing incendiary is not compatible with the XM-35 system and attempts to locate a compatible API round were not successful. Twenty millimeter HEI was used with unknown results, since 2.75 FFAR were also being fired from the same attack aircraft.

c. When HEAT rockets became available, results were mixed. The rocket is capable of penetrating armor, but direct hits on the target are required. This dictated that engagements be made at ranges of 900 - 1000 meters from the target, thus exposing the gunship to the tank's 12.7mm and to supporting infantry in the area.

d. Normal tank engagement was with TAC air. Upon sighting a tank or group of tanks, the Cav gunships would engage them to maintain contact, then turn the target over to the Air Force and continue recon missions. If TAC air was not available, the gunships would engage

tanks until their ordnance was expended, but rarely had enough ordnance to destroy every tank in a particular sighting. Between 8 Feb 71 and 24 Mar 71, the Cav sighted 66 tanks, destroyed (burned) six, and immobilized eight. The majority of the other tanks not destroyed or damaged by the Cav were turned over to USAF. Three of the destroyed tanks were hit with flechettes, HE and WP; and the other three were destroyed by combinations of flechettes, HE, WP and HEAT.

e. It is necessary to note that the PT-76 cannot correctly be classified as a true tank. It can best be described as a lightly armored personnel carrier; the AH-1G with present weapons systems would have little or no effect against a tank such as the T-54. The following criteria were established by the 2/17 Cav to claim a tank destroyed or damaged. To classify a tank destroyed, the tank had to explode or burn, whereas a damaged tank was immobilized, parts were blown off and the tank was incapable of further movement without repair. While admittedly restrictive, the use of these reporting criteria showed an accurate picture of results obtained with weapons employed.

7. Use of the OH-6A

a. The Cav tailors its reconnaissance teams to cope with the enemy threat in the area of operations. For example, in the pacified lowlands of Quang Tri and Thua Thien provinces, reconnaissance is performed by a "white" team composed of two OH-6A's. These aircraft are lightly armed and vulnerable, but have good visibility and maneuverability. In the piedmont and fringes of the mountains the Cav uses one OH-6A and one AH-1G to form a "pink" team. The OH-6A performs the recon, and the AH-1G provides protection, navigation, and target destruction. In higher threat areas such as the A Shau Valley and Vietnamese salient a heavy pink team with UH-1H Command and Control aircraft is used. This team is composed of an OH-6A for reconnaissance, two AH-1G's for protection of the OH-6A and initial fire support, and the UH-1H whose primary function is to direct the team and to extract downed crews.

b. It became apparent that the OH-6A was too vulnerable to operate in the LAMSON 719 environment as a part of a recon team. It is too lightly armored and will not withstand the number of hits that the AH-1G will. As a result, the Cav troop commanders elected to

operate teams with two to six AH-1G's and a C&C aircraft. Former OH-6A scout pilots were used as AH-1G crew men, and the AH-1G was used as the primary reconnaissance vehicle. Although not designed for reconnaissance, the AH-1G proved a good scout vehicle. It had the ordnance to immediately engage enemy positions that threatened it, and had enough speed to make high speed runs through suspected hostile areas without unacceptable risks.

8. Support Requirements

a. LAMSON 719 reaffirmed that air cavalry squadrons, to be fully effective, must have immediate access to USAF support. The Cav has the ability to locate and record enemy targets, but frequently lacks the firepower to destroy them. Prior to LAMSON 719 the 2/17 Cav used the 101st Abn Div (Ambl) Air Liaison Officer and control headquarters as its TACP, and FAC's were borrowed from the infantry brigades to provide USAF support in the Cav area of operations.

b. When LAMSON 719 began the Division ALO remained with Division headquarters and the brigade FAC's remained in support of their respective infantry brigades, and thus were not available for Cav support in Laos. As a result, even though TAC air and "out of country" FAC's were available during LAMSON 719, the Cav was initially unable to employ these assets because of a lack of knowledge of FAC frequencies, assigned areas, and USAF rules of engagement.

c. On 2 Mar 71, a TACP was attached to the 2/17 Cav at Khe Sanh, significantly improving and expediting air cav requests for TAC air support. In addition, one FAC was assigned to work with the air cav troops on the most lucrative targets. The FAC was shifted by the TACP to other troop areas of operations as targets were developed.

9. CO, 2/17 Cavalry Comments

a. The traditional missions of cavalry (reconnaissance, security, and economy of force) were all performed during LAMSON 719. From a cavalry viewpoint, the deep reconnaissance mission was most successful in that it accentuated the primary advantages enjoyed by US/ARVN forces over NVA, the mobility and firepower differential. The NVA were unable to counter effectively the reconnaissance in depth due to the large and constantly shifting area of coverage. The associated

125

freedom in use of supporting fires (TAC air, ARA, arty) not in close proximity to friendly troops, made the firepower and mobility advantages more apparent.

b. In a combat environment where the enemy poses an armor threat, air cavalry must have an adequate tank-killer capability. Once armored targets were acquired, the technique of fixing the target until more effective fires could be brought to bear was quite effective in LAMSON 719. This was accomplished, however, against the PT-76 which has very light armor plate. Against a true tank, the capability to fix such targets is very doubtful.

c. The OH-6A is marginally suitable as a scout vehicle in a low intensity environment. In a mid-intensity situation where an area is saturated with well-organized, multicaliber antiaircraft defense systems, the OH-6A is totally inadequate. This inadequacy is reflected in three critical areas. First, the aircraft will not sustain hits from weapons above .30 caliber and still fly home an acceptable percentage of times. Second, inadequate crew protection is provided (i. e., armor plate). Third, this aircraft does not have a weapon system suitable to the scout mission. The weapon system fires only straight ahead. In order to place suppressive fire on a target which has fired on the scout, he must go straight into the target. If he turns away (as he should) the target is left unsuppressed for a vital few seconds until the covering gunships are brought to bear. It is most desirable that future scout vehicles have a weapons system capable of firing to either side and approximately 135 degrees to the rear.

d. The AH-1G and the UH-1H (also organic to the air cavalry squadron) proved to be effective, rugged machines, entirely capable of adequate performance in the LAMSON 719 environment.

E. (U) COMBAT ASSAULTS

1. General

Organizing and conducting successful airmobile assaults is the ultimate objective of all airmobile operations and is the most difficult phase to achieve successfully. During the initial phase of LAMSON 719 ARVN forces assaulted into Laos on a wide front by establishing firebases RANGER, LZ 30, LZ 31, LZ DON, LZ BLUE, and LZ ALUOI. Air Mission Commanders were learning techniques for dealing with enemy antiaircraft weapons, adverse weather, new terrain and selection of LZ's.

2. Command Guidance

As the first month of LAMSON 719 ended, the ARVN campaign was progressing. However, a new battle plan was formulated, and on 1 March CG, I Corps announced his guidance. The 1st ARVN Infantry Division would attack west along the escarpment by establishing a series of fire bases--LOLO, SOPHIA, and would occupy HOPE. Each fire base would support the assault on the subsequent fire base. The CG, I Corps reaffirmed his goals by stating that the principal objective of the Republic of Vietnam was the landing of Vietnamese troops in the Tchepone area. The mission accomplishment of LAMSON 719 depended upon successful combat assaults in a mid-intensity environment.

3. Planning

a. Ground Planning

ARVN commanders conducted briefings daily to keep supporting units abreast of the situation and to generate planning among their staff. The aviation battalion commanders attended each of these briefings and knew at least 24 hours in advance what the supported division planned for the next day. The ground commander designated which area would be assaulted and gave his concept of the operation. The Air Mission Commander worked very closely with the Ground Commander to formulate the plan in reverse planning sequence. The

Ground Commander was especially concerned with fire support once on the ground and the number of aircraft required.

b. Aviation Planning

(1) Flight Routes

Flight routes were planned to avoid enemy antiaircraft weapons and to overfly friendly positions when possible. In the initial phase of LAMSON 719 these were not so important since distances to the fire bases and LZ's were limited; however, routes became very important when flying further west. Those aircraft utilizing fire bases as safe havens were practically all recovered, whereas others were lost in unsecured areas. During times of poor visibility the Xe Pon River was the only visible means of navigation and became a natural flight route. This was especially true during the assault of LIZ.

(2) Flight Altitudes

Previously 1500 feet was considered safe from ground fire. Heavy antiaircraft weapons in Laos drove the aircraft to considerably higher altitudes. Above 6,000 feet AGL the aircraft are subjected to 37mm and larger weapons while below 4000 feet AGL they were engaged by 12.7mm machine guns and smaller caliber. There was no safe altitude, but most flights conducted between 4000 and 6000 feet AGL were not successfully engaged.

(3) Weather

Throughout LAMSON 719 weather had a major effect on the timing of airmobile operations. Rain, early morning fog and limited visibility frequently delayed airmobile operations for the entire day. Weather was considered in the planning of all combat assaults, and as a result H-hour was a flexible time.

(4) Formations

Single ship trail formations showed early promise and were successfully used throughout LAMSON 719; these formations varied but were usually flights of ten. One-ship and two-ship land-

128

ing zones precluded the use of mass formation flying. The widely dispersed trail formation reduced the possibility of loss of more than one aircraft to a single engagement.

(5) Turn Around Time

Multiple lifts make the turn around time between the PZ and the LZ a critical factor. In the early phase of LAMSON 719 for assaults of RANGER, 30, 31, BLUE, HOTEL, etc., each aviation battalion competed for the use of the Khe Sanh POL facility. Schedules were difficult to follow in that each AMC had a fluid H-hour, and it was not uncommon to see several flights converging on Khe Sanh POL at the same time. When mass lifts were planned and all aircraft were supporting the same AMC (LZ HOPE) staggered refueling was used at FB VANDERGRIFF, Quang Tri and Khe Sanh.

(6) Aircraft Load

A standard ACL of six to seven troops was used by the 101st Aviation Group on previous operations with the ARVN and proved acceptable throughout LAMSON 719.

(7) Reconnaissance

The AMC conducted a joint reconnaissance with the Ground Commander to determine the routes of flight and LZ location. The critical factor was exact LZ and alternate LZ locations. In the initial phase of LAMSON 719, ground commanders were satisfied if the aircraft were landed in the general LZ area. (LZ RANGER was relocated approximately 800 meters just four minutes before arrival of the lift ships). During the assault of LIZ, relocation of the LZ 200 meters north to an alternate location was difficult.

(8) Coordination of Fire Support

The AMC planned the use of all weapons and recommended a fire support plan to the Ground Commander that would best support the operation. (See para 9, Landing Zones)

(9) Downed Crew Extraction and Aircraft Recovery

Two items always included in the planning were downed aircraft recovery and downed crew extraction. The number of aircraft allotted to downed crew extraction would vary with the size of the assault element. A figure of one extraction aircraft per ten lift aircraft was used most frequently. Planning for aircraft recovery was coordinated with the downed aircraft recovery center established by the 101st Aviation Group.

(10) PZ Selection

Throughout IAMSON 719, pickup zones for combat assaults were established by the Ground Commander of the assault forces. When the PZ was located on known friendly terrain, little deviation from established considerations occurred. When the PZ was located on known or suspected hostile terrain, a variety of new considerations developed for determining the best area from which the friendly forces could be extracted. The primary threat to pickups was enemy direct and indirect observed fire. The solution was to locate the PZ in defilade, in terrain that aircraft could hide their approach paths without the risk of small arms fire. PZ's behind the shoulders of nearby ridge lines, and the back slopes of hills held these advantages.

(11) LZ Selection

The initial reconnaissance with the Ground Commander should determine if the LZ meets both the criteria from the aviation view and the tactical plan of the Ground Commander. Alternates were suggested and often approved. (See par 3b(7) Initial Reconnaissance).

(12) Planning Time

The AMC usually had sufficient time for the formulation of his plan and a briefing of all flight commanders prior to the assault. Briefing of flight crews was usually conducted just prior to launch.

4. Command and Control

a. General

The Air Mission, Ground Commander, their deputies and staffs who plan, direct and coordinate, composed the command and control element. Control was usually airborne in a command and control UH-1H aircraft. Alternate leaders were appointed, and a clearly designated succession of command down to the lowest level was established.

b. Command and Control of Aircraft

To control operations during LAMSON 719, the AMC had with him the Ground Commander or his representative, an ARVN artillery liaison officer and an interpreter, when available. Due to the time required to complete the larger operations, alternate AMC's were designated, each with a corresponding Ground Commander's representative. When the PZ was a field location, command and control aircraft were necessary to insure a smooth flow of traffic into the PZ. Command and control aircraft were also designated for aircraft recovery and downed crew extraction operations. These additional command and control elements enabled the AMC to focus his full attention on the assault phase of the operation.

c. Radio Nets

The AMC maintained communications with the Air Force FAC on FM and VHF. VHF was also his primary means of communication with his reconnaissance element, the cavalry, who was given control of all airborne fire support elements prior to the assault. Flight control was maintained on UHF with each flight commander. FM secure was used extensively to communicate secure information and to make recommendations for changes in the basic plan. Only UH-1H aircraft of the 101st Abn Div (Ainbl) were equipped with a secure capability, and this limited considerably the flow of classified information and situation reports. All aircraft monitored the UHF command net.

d. Flight Control

Flights of ten UH-1H aircraft were determined to be most acceptable and provided flexibility and control. This coincided with the requirement of ten aircraft per lift company and promoted flight integrity. Internal flight control was conducted on VHF.

5. Reconnaissance

a. Initial Reconnaissance

The primary reconnaissance of LZ areas was accomplished by the division's organic cavalry squadron. The cavalry troop assigned the reconnaissance mission of a designated LZ area would begin its work as much as three to four days in advance of the assault. The reconnaissance of the LOLO area began a full week prior to the assault. Particular attention was devoted to locating usable touch-down points, and detecting enemy positions. All detected enemy positions were dealt with by the appropriate weapons system available which ranged from airstrikes to AH-1G gunships. Three 12.7mm positions approximately one kilometer southwest of LOLO were detected by the cavalry one week prior to the assault. These targets were given to the Air Force and destroyed. This is only one example of the rapid employment of massive fire power in response to reconnaissance information which has proven to be so successful in neutralizing enemy threats. The locations of possible LZ's, enemy positions, and notable cache sites were passed by the cavalry troop through its higher headquarters to the AMC and Ground Commander. The troop would continue its reconnaissance of the LZ area during the following days in attempts to detect and neutralize additional enemy positions. When the AMC and Ground Commander decided upon a suitable touchdown point, the cavalry troop employed air strikes and TAC air on the primary LZ, its approach and departure paths, and areas which were suitable for use as alternate LZ's. The troop placed great emphasis on continuing its operation in a large area to prevent the enemy from determining the exact location of the LZ and adjusting his defense accordingly.

b. Final Reconnaissance

132

On the day of the combat assault, the troop no longer concealed the location of the LZ. Along with the AMC and Ground Commander, the cavalry troop directed air strikes and TAC air on the LZ. When the AMC and Ground Commander judged the LZ and approaches to have been adequately prepared for the combat assault, they lifted the supporting fires and directed the air cavalry to conduct low-level reconnaissance of the LZ to determine if it was ready for the combat assault to begin. This final reconnaissance just before launching of the combat assault was the most crucial reconnaissance of all. The AMC and Ground Commander usually approved the cavalry commander's recommendation either to begin the combat assault or to employ additional preparatory fire power. On SOPHIA, the cavalry drew 12.7mm fire on their final reconnaissance of the LZ. The AMC and Ground Commander approved the cavalry commander's recommendation to employ additional preparatory fire power. More than an hour of additional preparation was put on specific targets the cavalry troop had located, concentrating heavily on gun emplacements. The cavalry then conducted another final low-level reconnaissance and advised the AMC and Ground Commander that the LZ was now ready. Once again the AMC and Ground Commander concurred with the cavalry commander's recommendation, and the assault was commenced.

6. Staging

The staging phase of a combat assault enabled the AMC or his representative to assemble all of his assets and conduct his crew briefing. The staging area was always in a secure area and close to the combat area with all aircraft involved using the same staging area. The massing of large numbers of aircraft in one area close to the combat area ran a risk of presenting the enemy with a lucrative target for his long range weapons. The combat assault of LZ HOFF was staged from Khe Sanh on 6 March. 120 lift ships were subjected to incoming 122mm rocket fire prior to launch time. Fortunately all aircraft departed the area without damage. The advantages of this method of staging were an early formation of the flight, insurance that everyone received the same briefing and the erased necessity to refuel the flight prior to completion of the first lift. These factors all aided in reducing confusion in a most difficult phase of airmobile

operations. Possibly the most important advantage of staging close to the combat area was the immediate reaction time of the flight in the commencement of the mission.

7. Pickup Zones

a. Selection

(1) Security

When possible the PZ was located in a secure area to reduce the complexity of the combat assault. On occasions troops to assault were extracted from a hostile environment, as in the case of the assault on LZ LOLO.

(2) Preparation

The PZ's were chosen and prepared to minimize the length of time the aircraft were required in the PZ to make their pickup of troops.

b. Coordination

When the PZ was a field location, coordination and timing became extremely important. If the aircraft arrived and the troops were not ready, the flight had to either hold in orbit or return to the staging area. This resulted in allowing the enemy to guess our intentions and wasted valuable blade time. When the troops were ready and the aircraft were not, the massed troops became inviting targets for indirect fire attacks by the enemy.

c. Control

It was found advantageous to have a PZ control party. These personnel insured that the troops were broken down into aircraft loads to facilitate orderly and rapid loading of the aircraft. PZ control also informed the AMC and Ground Commander of the number of sorties remaining in the PZ and any problems which arose. This was done on the assault of LZ RANGER and resulted in a smooth operation. The technique was continued for all later operations.

8. Flight Routes and Altitudes

a. General

The two major considerations of the enroute phase of the combat assaults during LAMSON 719 were the flight routes and altitudes to be used. Factors to be considered were the deployment of enemy antiaircraft weapons, weather, artillery fires, and the overflying of friendly positions. During LAMSON 719 flight altitude of 4000 feet AGL was found to keep the aircraft out of 12.7mm range. On the major assaults of early March, the late afternoon haze combined with the setting sun made navigation almost impossible for flights to the west. The Xe Pon River was the only navigational aid which proved to be effective. This necessitated all afternoon flight routes to be flown in close proximity to the river. When possible, flight routes passed over fire bases to afford the flights safe havens to be used for precautionary or forced landing areas.

b. Aircraft Control Points

The use of large numbers of lift aircraft broken into multiple flights coupled with the navigational problem and the extremely hostile environment, required extensive use of control points. This permitted the AMC to adjust the flow of aircraft to meet the changing situation.

c. Route Escort

Gunships escort of the flight route was provided by the ARA, cavalry gunships, and escort gunships. These aircraft would follow the lift aircraft's flight route to and from rearm/refuel. Enroute enemy fire was engaged by these aircraft. If their fire support was not sufficient, the flight route was shifted until either airstrikes, TAC air, or artillery or a combination of these had neutralized the enemy fire.

9. Landing Zones

a. Preparation

(1) Airstrikes and TAC air

The preparation of a LZ was not limited to the LZ itself. In the days prior to the assault, airstrikes and TAC air were employed on both preplanned and targets of opportunity detected by the air cavalry reconnaissance. Airstrikes were also used to clear LZ's within the designated areas.

(2) Artillery

On the day of the assault, after fully employing airstrikes and TAC air, tube artillery was fired on the LZ. The artillery preparation was not always used due to range limitations, the rapid execution of the operation, and the requirements for airspace. For example, early in the afternoon of 4 March, the 1st Infantry Division Commander decided to assault LIZ without artillery preparation rather than wait until 5 March when the ARVN artillery on LOLO could have been employed.

(3) ARA

When artillery fires were completed, the ARA began their fires. The ARA, under direction of the cavalry unit commander, placed their fire in and around the LZ on known or suspected enemy targets until the lift aircraft arrived.

(4) Escort Gunships

The escort gunships fired suppressive fires along the approach path and around the touchdown point of the lift aircraft. The transition from one type fire to another must be accomplished rapidly to provide continuous fire support in the LZ area.

b. Control

Due to the intense resistance by the enemy, control in the LZ area during LAMSON 719 was more difficult than previously experienced. As a result, control became a more critical consideration. Indirect fire placed on LZ's required rapid unloading of troops. Pockets of intense small arms and antiaircraft fire required strict adherence to prescribed approach and departure paths. Decreased visibility in the LZ areas necessitated the dropping of a smoke grenade in the LZ to mark the touchdown point for the following aircraft. The small size of most LZ's made necessary the landing of lift aircraft one at a time. Even when the landing zones were quite large, the flights would touch down with extended separation to minimize damage to both aircraft and troops during the frequent indirect fire attacks employed by the enemy.

c. Fire Support

(1) Airstrikes, TAC air, and Artillery

While the lift aircraft were assaulting the LZ, the use of fire support was restricted to greater distances from the LZ. Airstrikes, TAC air and artillery all were employed on targets on surrounding terrain or along the flight route in areas where they would not greatly restrict the flow of the assault. Throughout the assault on OBJ HOPE Air Force fire power was employed on the higher ground to the north. It effectively suppressed all antiaircraft targets detected by the air cavalry teams. TAC air was also used during LAMSON 719 to lay smoke screens near the LZ to shield it from direct observation by the enemy.

(2) Employment of Smoke by US Air Force

High performance aircraft utilizing CBU bomblets were used extensively throughout LAMSON 719 to deny the enemy visual observation of the helicopters during the critical approach to the departure from the LZ/PZ. A one hour lead time was usually necessary to obtain the coverage desired by the AMC. The bomblets were

very effective and usually accurately delivered. Some problems involving troop safety criteria and timing were encountered. In support of the combat assault of LZ SOPHIA, the requested direction of the screen could not be accommodated so an alternate was selected. After the first pass a slight adjustment was made in direction. The second pass exceeded the troop safety criteria and the mission was aborted. The combat assault of LZ HOPE was initiated ten minutes early because of an indirect fire attack on the staging area. When called upon to deliver early, the smoke aircraft were in the process of airborne refueling. As a result the smoke arrived ten minutes late.

(3) ARA, Cavalry Cobras, and Escort Gunships

The close support of the lift element was provided by ARA, Cavalry gunships, and escort gunships. During the assault on OBJ HOPE, these armed helicopters were employed throughout the entire area. One cavalry troop screened to the north and west and also employed TAC air on targets detected. One cavalry troop screened to the south along the approach path. ARA was in a high orbit over the LZ and employed on targets detected by the cavalry. The UH-1C gunships provided coverage of the valley floor south of the LZ. AH-1G escort gunships provided coverage for the lift aircraft from the release point at SOPHIA to the LZ.

10. Gunship Requirements

a. Demand

In the early stages of LAMSON 719, it became quite apparent that the role of the armed helicopter was vital to the successful accomplishment of the airmobile mission, whether combat assault, extraction, medevac escort, re-supply, or aircrew recovery. Due to the amount of enemy antiaircraft fire throughout the area of operation around LZ's and PZ's, the number of gunships required to provide security for the UH-1H lift aircraft increased significantly. Based on this need, the amount of gunships increased from the normal one light fire team (i.e. 2 gunships) covering up to twenty UH-1H's to approximately one light fire team for every five UH-1H's. This increase created a major control and allocation problem.

138

b. Control

Initially it was necessary to place one escort gun team leader in charge of all escort guns, and he employed his assets upon command of the AMC. A later innovation was to place the escort gunships under control of the cavalry commander for integration into the fire support effort. This tactic was first used in the assault of LZ LIZ. As more gunship assets became available to the ground force commander, distinct areas of responsibility were assigned. Examples of this were gunship coverage along the flight route with the mission of suppressing enemy fire, gunship coverage from RP to the LZ with primary responsibility to the LZ area. By dividing these responsibilities, the AMC had his assets in position to effectively engage enemy antiaircraft positions along the entire flight route without diverting his escort gunships from the lift aircraft.

11. Resupply Requirements

Considerations which were made during combat assaults also held true for resupply missions. These often developed into mini-combat assaults requiring fire support and a command and control element. Besides those problems normally associated with combat assaults, other problems were encountered during resupply missions. Units were not at the grid coordinates where they were scheduled to be. When aviation support elements requested the ground to display smoke to mark their location, the enemy also employed smoke. Later operations were conducted with one ARVN with a radio on board the aircraft to assist in locating the ground units and help unload supplies. One problem arose from the reluctance of the ARVN to talk on the radio unless their correct callsign was heard. Initially the callsigns used were from the ARVN SOI, and if the US pilot failed to pronounce the callsign properly, he received no response. This was solved by assigning the advisor callsigns, consisting of only letter designations (QY, CFW, etc.) to the ARVN battalions themselves.

F. (U) COMBAT EXTRACTIONS1. General

Extractions were accomplished of both units on fire bases and units in field locations. It was known that each fire base established would require an extraction. The NVA knew this also and located antiaircraft weapons and mortars in very close proximity to each fire base. These weapons harassed the resupply effort throughout the operation and eventually blocked or impeded attempts at extraction. Friendly forces on the ground were faced with securing the areas surrounding the PZ or fighting their way to another location for pick-up. Fire bases occasionally became impediments to the commander unless he was willing to leave the artillery tubes and move. In an airmobile mid-intensity environment an assessment had to be made of the cost of artillery pieces versus the cost of the extraction aircraft and the risk to the air crews. Extraction of units in heavy contact was difficult to plan and costly to execute.

2. Planninga. Concept

Extractions had an inherent hazard not experienced in the combat assault. The element of surprise was lost. The NVA knew where the aircraft were going and were usually registered on the PZ prior to arrival. HOTEL II provided a good example. All attempts to extract from the fire base itself failed. A successful extraction was predicated upon neutralizing the enemy direct and indirect fire weapons and limiting his observation of the PZ and the aircraft. Detailed planning for this aspect of the extraction was necessary. The integration of supporting fire with the capabilities of the cavalry and the FAC were essential in neutralizing enemy resistance around the PZ to enable the ground unit to break contact and be extracted.

b. Aircraft Requirements

On several extractions complicated by heavy enemy pressure, an accurate troop count could not be obtained by the ARVN ground commander. This resulted in overcommitment and consequent exposure of aircraft. The correct number of aircraft to perform the

mission should be arrived at jointly by the Ground Commander and the AMC in the early planning phase if possible.

c. Flight Altitudes and Routes

Primary and alternate flight routes and altitudes to avoid antiaircraft fire and afford good visual navigation became particularly important when the 30-second separation trail formation was selected. If any aircraft became lost, those behind that aircraft were also lost. Flight routes were cleared prior to launch to avoid friendly artillery and airstrikes. The visibility during LAMSON 719 was generally poor and deviation from prescribed flight routes was common and sometimes costly. Flight over the escarpment south of the river at 6000 feet was usually considered safe. Additionally, the safe havens of HOTEL and DELTA were available for emergencies.

d. Aircraft Load

The density altitude throughout the area required a standard aircraft cargo load (ACL) of seven troops for extraction. Actually, some aircraft extracted as many as 15 troops. PZ control was difficult throughout the operation.

e. Identification of Friendly Troops

Positive identification of friendly troops around the PZ was seldom achieved and the maximum use of TAC air, ARA and escort guns could not be accomplished. Additionally, the hugging tactic of the enemy around the PZ placed them so close to the ARVN elements that accuracy was more important than volume and enemy antiaircraft weapons and small arms fire were never completely eliminated.

3. Command and Control

The same command and control techniques described in combat assaults were necessary in combat extractions. On one occasion, an extraction from a PZ in contact just west of DELTA preceded the combat assault into LOLO. An additional command and control aircraft was required to conduct the combat assault.

141

4. Pickup Zones

a. Locations

Pickup zones were usually fire bases or night defensive positions (NDP's) and the ground troops were generally in contact. Touchdown points were identified by a high visibility panel or smoke.

b. Reconnaissance

The reconnaissance conducted by the cavalry located and neutralized enemy antiaircraft positions. However, the distance between the friendly elements and the enemy around the PZ was so limited that a reconnaissance and screening in depth could not be conducted without taking friendly casualties. Upon the recommendation of the cavalry commander, the final flight route was selected. The exit route recommended was usually the same because of the difficulty in neutralizing enemy fire on two routes.

c. Preparation

As the lift ships neared the release point, they were escorted by additional gunships into the PZ. Suppression below and around the flight path was conducted by the escort guns while ARA AH-1G's, after completing their preparation, circled overhead for on-call fire support. During the extraction phase, the supporting fires were violent and continuous, denying the enemy access to his weapons positions.

d. Special Characteristics

Extractions of troops in contact began early in the operation. The extractions of both LZ RANGER and FB HOTEL II were conducted during periods of heavy contact. The aircraft were forced to come directly into a ground combat environment while in the PZ. Combat extractions throughout LAMSON 719 were characterized by similar adversities.

142

e. Downed Crew Extractions

Downed crew extraction aircraft followed their flight but remained at altitude.

5. Fire Support

The competition for airspace required that a geographical area of responsibility be prescribed for fire support control. It consisted of a 1000 meter zone around the PZ where permission to fire could be granted only by the Ground Commander. Areas were assigned to each fire support system (TAC air, ARA and escort guns) for suppression and destruction. A separate area was designated for screening by the cavalry, and on-call TAC air smoke missions were planned by the AMC to screen the most vulnerable flank. A smoke screen was used during the extraction of the 4th Bn, 1st Regt, 1st ARVN Inf Div. The CBU smoke exceeded troop safety limits and was immediately terminated by the FAC. When hard targets beyond the capability of the gunships were discovered, the gunships would reach the target for the FAC and move to another area. After the extraction was completed, control of all fire support means was transferred to the cavalry commander. This was done to inflict as much damage as possible to the enemy. The lift aircraft returned by the same route unless it was interdicted by antiaircraft fire or weather.

CONFIDENTIAL

143

G. (C) HEAVY LIFT OPERATIONS

1. General

a. Purpose

To depict the participation of medium and heavy lift helicopters in Operation LAMSON 719.

b. Scope

This subsection will address all aspects of the operation involving medium and heavy lift helicopter. It will include enumeration, analysis and discussion of the planning, coordination, conduct and control of all support rendered. Support aspects to include intelligence, fire support, maintenance, and communications will also be considered. The final section of the report will summarize support provided and the results of enemy actions.

c. Organization for Combat

(1) Organic Units

The 159th Aviation Assault Support Helicopter Battalion, 101st Aviation Group, with three TO&E assault support helicopter companies and the attached 478th Aviation Heavy Helicopter Company (HHC) formed the nucleus of the medium and heavy lift forces.

(2) Non Organic Units

(a) The 132d and 179th Assault Support Helicopter Companies (ASHC) from 1st Aviation Brigade assets, were placed under OPCON of the Commanding Officer, 159th Aviation Battalion.

(b) The 463d Helicopter Marine Heavy (HMH) Squadron, USMC, was placed in support of the 159th Aviation Battalion, on a mission bases.

(3) Operational Bases

(a) The organic units operated out of their permanent

IV-33

CONFIDENTIAL

CONFIDENTIAL

144

base camp facilities, with the three letter companies located in the vicinity of Phu Bai airfield and the 478th Aviation Company at Red Beach, Da Nang. To improve response times, two to three 478th aircraft were staged at Phu Bai airfield each night.

(b) The 132d Assault Support Helicopter Company was based at North Phu Bai adjacent to and sharing maintenance facilities with Company B, 159th Aviation Battalion.

(c) The 179th Assault Support Helicopter Company occupied a previously abandoned CH-47 revetment area at Camp Eagle.

(d) The 463d HMMH Squadron operated out of a permanent base camp at Marble Mountain Airbase, Da Nang.

2. Mission

a. Provide medium and heavy lift capability, in support of combat assault operations, for two ARVN Divisions; one Vietnamese Marine Division; an ARVN Ranger Group; Corps Artillery units; elements of the US 101st Airborne (Airmobile), 23d Infantry, and 5th Infantry (MECH) Divisions; elements of US 7th Air Force; and Da Nang Support Command.

b. Conduct normal and emergency resupply of fire bases and base camps.

c. Perform administrative and tactical troop movement.

d. Accomplish recovery of disabled aircraft.

e. Perform MEDEVAC and special missions on call.

3. Intelligence

a. Collection, Evaluation, and Dissemination

All intelligence from sources outside the 159th Avn Bn and its subordinate units was obtained from either the 101st Avn Group S-2 or the 101st Airborne Division (Airmobile) G-2. Raw information from agent reports, visual reconnaissance, radar, sensors, captured documents, POW's, and other sources was evaluated by either the 525th

IV-34

CONFIDENTIAL

CONFIDENTIAL

145

MI Group, the 517th MI Detachment of the 1st Brigade, 5th Infantry Division (Mech), or, the 101st MI Detachment of the 101st Abn Div (Ambl). From these agencies, the intelligence followed the normal dissemination chain to the 101st Abn Div (Ambl) G-2 and the 101st Avn Gp S-2. There was, of course, an exchange of intelligence with RVN forces at division level. Intelligence was also generated by elements of the 101st Avn Gp. Intelligence mainly concerning antiaircraft fires, was obtained from air crews organic to or supporting the 159th Aviation Battalion. Some intelligence was obtained through liaison meetings and direct contact with personnel from other units.

b. Use

Intelligence was collected by the battalion S-2 section and passed on to the aviation companies, staff sections, and other interested personnel through formal briefings and informal visits. The S-2 and each subordinate unit maintained an intelligence map showing information of interest to the air crews and commanders. All pilots were briefed prior to starting a mission. Fresh intelligence was passed by radio as obtained. Air Mission Commanders received detailed briefings during the planning phases.

c. Impact on Operations

Intelligence on enemy fires was a major factor influencing selection of flight routes and altitudes. It also affected tactics employed and the timing of the operations.

d. Analysis

Although the intelligence used was rather limited in scope, in that it concerned mainly enemy antiaircraft fires, it continued to have a major influence on the mission. The intelligence obtained, and the methods used to obtain it, were adequate for an operation of this type.

4. Operations

The conduct of Operation LAMSON 719 brought into play all of the

IV-35

CONFIDENTIAL

CONFIDENTIAL

functional areas usually associated with major airmobile operations. The particular manner by which planning, coordination, command and control, fire support, communications, and maintenance were affected and conducted is outlined below. Additionally, each of the various types of missions performed by the medium and heavy lift elements.

a. Planning

(1) The planning for heavy and medium lift operations during LAMSON 719 was conducted at battalion level by the battalion commander, his staff, and the company commanders.

(2) Pre D-Day planning was initiated on 28 Jan 71. General areas of consideration during planning were the organization for operations, command and control, displacement forward of a battalion operations center, maintenance requirements, and staging for the operation.

(a) A forward battalion operations center was planned to be established at Khe Sanh with the mission of planning, controlling, and coordinating the battalion's operations forward. The BOC (forward) would collocate with the 101st Aviation Group (forward) to facilitate operations.

(b) Consideration was then given to the staging of aircraft out of Khe Sanh, and the concept was evaluated. It was projected that a company would stage out of Khe Sanh on a rotational basis, maintaining operations forward for two weeks at a time. This concept was subsequently discarded because the enemy situation made staging at Khe Sanh overly hazardous; there were no suitable areas available for parking and maintaining the aircraft; and the physical security of the aircraft and equipment would require excessive amounts of manpower. In addition, consideration was given in support of a contingency plan for moving supplies from the rear to the forward area of operations. This plan would best be supported by staging out of rear areas in the vicinity of Phu Bai. Taking all these factors into consideration, the final decision was made to stage out of the Phu Bai area.

(c) Maintenance in the forward area was of interest during planning and the suggestion for using a maintenance team at Khe Sanh was considered. It was resolved that since the aircraft

IV-36

CONFIDENTIAL

CONFIDENTIAL

147

would be staging from base areas at Phu Bai, the additional support forward would not provide the best use of maintenance personnel or their equipment. Further, such a maintenance operation would be so narrow in scope that the assistance provided by such a maintenance team would be negligible.

(3) During the preparation for operations, it was determined that all command and control, coordination, and mission planning would be conducted by the BOC (forward) through use of LNO's, C&C elements, AMC's, and flight leads. It was anticipated that BOC (forward) would plan its missions as received from Group and then pass the requirements through the CP main, located to the rear, to the companies for implementation. Moreover, the control channels would originate from the BOC and then be directed through either the AMC, C&C, and/or flight lead as required to meet the mission. Coordination would be handled by commanders conferences, AMC briefings, and LNO's provided to the BOC.

(4) Analysis of Planning Revealed

(a) Long range planning would be limited at battalion level. This was due primarily to the tactical environment and the very nature of airmobile operations. In order to overcome this disadvantage, a great deal of the inherent flexibility was incorporated into each operational plan.

(b) Logistic planning on a day to day basis must be as accurate as possible when passed to the unit required to execute the tasks. Unless accurate information concerning sorties and tonnage is available in the planning stages, the commander cannot determine the number of aircraft required to perform the assigned tasks, and unnecessary delays in the completion of the tasks may result.

b. Command and Control

(1) The command and control element of the battalion headquarters was subdivided into two elements with the battalion commander in charge of the forward CP and the executive officer in charge of operations at the home station in Phu Bai. The forward CP was manned to

IV-37

CONFIDENTIAL

CONFIDENTIAL

personnel were on a 24 hours basis with the following personnel:

- (a) Battalion Commander
- (b) S-3
- (c) Operations Officer
- (d) Duty Officer (SD from CH-47 Company)
- (e) 3 Radio Telephone operators
- (f) 2 Communications personnel
- (g) 1 Generator operator/driver

The shifts divided with the bulk of the personnel present during the operations day (0700-1900) and the remainder on duty during the night for planning and consolidating requirements. The command and control personnel were present and functioning in their respective areas throughout both shifts. The command and control was effectively maintained in the operational area by use of the C&C aircraft by the Battalion Commander and S-3.

(4) The rear CP was also manned on a 24-hour basis, using personnel from the letter companies to supplement the remaining personnel. The rear CP was used to receive and compile mission aircraft reports, and to allocate the missions to each of the assigned and attached units.

(C) Command and Control (C&C) Aircraft

The forward command post was furnished a UH-1H to support the OH-6A helicopters. These aircraft were used to support, resupply, and extraction operations. Personnel from the forward CP conducted liaison visits to supported units, briefed them, and monitored flight routes to and from the landing zone. These aircraft were further used to reconnoiter, make weather checks, and otherwise assist the mission in the successful execution and completion of their tasks.

CONFIDENTIAL

CONFIDENTIAL

149

c. Fire Support

(1) Employment

Fire support means employed in support of the heavy lift effort required a closely coordinated plan to give maximum coverage of the area.

(a) The 2d Squadron, 17th Cavalry, performed a recon role and provided recommended routes of flight into and out of landing zones. Additionally, the Cav screened selected area during the mission to discourage indirect and small arms fire. The Cav AMC and the 159th Avn Bn AMC worked in close coordination before, during, and after the mission to take advantage of the valuable information provided by the 2d Squadron, 17th Cavalry.

(b) Gunship escort was provided by both UH-1C and AH-1G aircraft. The AH-1G was preferred because of the large fuel capacity, resulting in longer station time. The gunships escorted the heavy lift aircraft into the LZ and provided coverage in the vicinity of the LZ, putting suppressive fire on active enemy locations. The gunships further developed the flight routes into the LZ by drawing enemy fire, enabling the heavy lift aircraft to avoid the active areas.

(c) AH-1G aircraft from the 4th Battalion (Aerial Artillery), 77th Artillery, delivered suppressive fire on enemy locations prior to and during missions. They were not engaged in direct escort of the aircraft; therefore, they were free to engage suspected targets in their specified area.

(d) TAC air strikes were sometimes used in conjunction with the heavy lift missions; however, a forward air controller was always on station in an area around the LZ with TAC air on call. The concept of having a FAC over suspected enemy artillery position while the resupply mission was in progress seemed to have some effect in reducing attacks by indirect fire. TAC air strikes were coordinated with Cav operations to establish approach routes to the LZ. Air strikes were employed on suspected enemy locations in the flight path. Upon completion of the air strikes, the Cav reconnoitered the area to assess

IV-39

CONFIDENTIAL

CONFIDENTIAL

the use of smoke of the air strikes. The use of smoke ships was another example of their employment. The Air Force had smoke available and it was used to help conceal the aircraft enroute and on approach to the LZ.

(e) Artillery fires were available from US and ARVN units. Artillery was fired on suspected enemy positions and on heavy lift efforts. The 159th Avn Bn AMC also coordinated the supported unit to insure accurate and timely fire on the desired locations. The artillery was fired into the LZ's by the ARA or TAC air.

CO, 159th Aviation Battalion Comments

The 159th Avn Bn accomplished its mission in support of LAMSON 719. The proper use of all available support facilitated this accomplishment. On numerous occasions, the mission was forced to abort because of heavy and direct fire on the LZ's. After applying artillery and other indirect attempts were made to accomplish the mission. In some instances, the enemy was able to prevent the aircraft from going onto the LZ. The rare times the enemy was not able to prevent either of effective long-range artillery or direct fire, both small arms and antiaircraft fire, of the enemy. When activity became this intense, even the use of C-130 aircraft were unsuccessful in resupply attempts. At Fire Base DELTA in the last days of the operation, the number of gunships was not always available because of combat maintenance problems, and combat assault requirements. The large number of fire bases demanded more than one flight of C-130 aircraft to accomplish all missions. Additionally, to effectively support the ground unit, it was desired to keep gunships on station continuously. This was not possible at times and resulted in some missions being delayed until the gunships refueled. A strong recommendation for future operations of this nature would be to attach a gun company to the support helicopter battalion. This would facilitate command and control of the gunships, making that unit directly responsive to the needs of the C-130 aircraft for all types of missions.

CONFIDENTIAL

CONFIDENTIAL

151

d. Assault Support Operations

(1) Organization for assault support operations varied, depending upon the nature of the operation, the turn-around time and the number of sorties to be moved or the time available for completion. A mission leader, normally one of the assault support company commanders, was appointed for each operation. The number of aircraft used varied from four to twelve. When the number exceeded eight, two flights were used to facilitate control. Aircraft for each operation were drawn from one or more of the assault support helicopter companies. On several occasions, heavy lift support by the CH-54 or CH-53 was used to insert heavy equipment loads such as bulldozers, backhoes and 155mm howitzers.

(2) Planning for assault support operations was performed by the battalion forward command post, and most often was short range in nature. The mission lead assembled his aircraft at a designated area, and the mission lead and aircraft commanders were briefed by personnel from the forward CP. The briefings entailed flight routes, altitudes, aircraft separation and locations of known antiaircraft weapons and enemy ground units. Detailed planning to include preplanned fires by artillery, close air support, and air cavalry and gunships, was accomplished prior to briefing the air crews.

(3) Sound tactics were an absolute necessity to insure that the battalion aircraft took a minimum of significant hits while operating in a mid-intensity conflict.

(a). Tactical considerations called for selection of flight altitudes, where possible out of range of small arms fire and beyond the effective range of most antiaircraft weapons. It was found that the aircraft took the largest number of hits when operating below 3000' above ground level.

(b) Flight routes were determined after analyzing "shot at" and "hit" reports, as well as intelligence reports of enemy locations. "Hot" areas were bypassed when consistent with the accomplishment of the mission.

IV-41

CONFIDENTIAL

CONFIDENTIAL

(c) Approaches and departures from landing zones (LZ's) were determined after reviewing the enemy situation around the LZ. Generally, approaches were steep, spiraling descents in close proximity to the LZ. This was done to minimize flight time at low altitudes and to avoid enemy antiaircraft positions.

(d) A variety of formations was used to optimize the effectiveness of support operations while minimizing vulnerability to enemy actions. Aircraft were frequently separated in both altitude and distance to inhibit the enemy's ability to strike at multi-aircraft formations; however, it was necessary to land the maximum number of aircraft in the shortest period of time because of the enemy's ability to deliver mortar fire on the LZ's when they saw aircraft on final approach. Usually, the first two or three aircraft would be able to deliver support into the LZ before it came under indirect fire. This situation dictated employment of smaller flights (two to three aircraft) or splitting larger flights into two sections of two or three aircraft each with a distance separation between the sections.

(e) Another tactic employed to reduce enemy responsiveness was to give a flight the requirement to support several forward bases. This gave the flight leader the flexibility to have his flight alternate between missions by delivering sorties to one base, then to another and back again to a third base or the first base. This technique permitted efficient operations with a minimum of wasted blade time and tended to confuse the enemy and reduce his responsiveness.

(f) CO, 159th Aviation Battalion Analysis of Tactics

1. It was found that tight formations, straight line formations and low level operations tended to increase vulnerability of aircraft to enemy action. Tight formations have a primary advantage of enabling door gunners to provide suppressive fire; however, because of the positioning of friendly forces near forward fire bases, this advantage was negated. Because of the greater vulnerability of aircraft in tight formations, this tactic was used only when the threat of indirect fire was the primary consideration.

2. Vietnamese (ARVN) pathfinders were often not

IV-42

CONFIDENTIAL

CONFIDENTIAL

153

to brief air crews on the current tactical situation around the fire bases. As a result, escort gunships were sometimes unable to get an assessment of friendly locations and could not engage potential targets. Also, lift aircraft could not plan their approach and departures bases on the most current tactical situation.

3. The ARVN pathfinders also were not briefed on the US use of colored smoke and would frequently mark an area for a load with red smoke, which, to the pilot, indicated the LZ was under attack.

4. Pickup Zones (PZ's) were located in South Vietnam and were normally adjacent to major command headquarters. Control and organization of the PZ's was facilitated by having U.S. pathfinders and riggers in the PZ to control the air traffic and to advise in the preparation of loads. Loads were normally well organized in the PZ's to permit multiple aircraft to work in the PZ simultaneously, while working the same mission or multiple missions. Police of the PZ's was adequate to prevent damage to aircraft or injury to personnel. In isolated cases, the PZ's could have been rendered more suitable with the removal of several tall trees. Liaison officers from the assault support helicopter battalion were placed with the major allied headquarters and proved invaluable in coordinating the PZ times, loads and priorities for deliver.

5. Landing Zones (LZ's) were in South Vietnam and Laos. Sites selected were usually on high ground and were basically unimproved when the first medium and heavy lift loads arrived.

a. The first sorties delivered normally were clearing and earth moving equipment for improvement of the landing zone. Seldom was the time lapse between the delivery of clearing equipment and the first loads of combat equipment sufficient to allow substantial improvements. In some instances, the ground units were directing loads into areas with tall trees surrounding the desired delivery point. Maneuvering in these areas at altitudes of 2500-3000 feet above sea level and density altitudes of 5000-6000 feet became critical. Variations in the weights of loads which appeared identical contributed to the difficulty of handling the loads in the landing zones. Very few

IV-43

CONFIDENTIAL

CONFIDENTIAL

154

loads were jettisoned or damaged during delivery; however, improvement of the LZ's progressed concurrently with the insertion and in many cases had produced suitable areas by the time the last sorties were delivered.

b. Communications with the allied LZ's in South Vietnam was adequate because of the use of American advisory personnel as radio operators. Communications with LZ's in Laos was normally inadequate because of the lack of trained English speaking controllers in the LZ's. On one occasion an assault support operation involving six medium lift helicopters was aborted and delayed more than one hour because of a lack of communication between the aircraft and the ground unit. One exception was the 1st ARVN Infantry Division, which had adequately trained English speaking controllers. These personnel greatly enhanced the smoothness of the operation.

6. Fire support for assault support operations was in varying degrees and forms. The most common fire support used was in the gunship CAP of the landing zone and the escort of each medium or heavy lift helicopter into the LZ. On many occasions the preparator fires ignited large scale grass or range fires that filled the air with smoke, dust and haze and made locating the LZ's extremely difficult. On more than one occasion, a command control ship had to individually escort the medium and heavy lift aircraft through the smoke and haze to the LZ.

(4) Example of Assault Support Operations

The mission in support of the insertion on LZ 1010 was assigned to the 159th Assault Support Helicopter Battalion with the assistance of the 132d Assault Helicopter Company, OPCON to the 159th, and the III MAF Squadron HMH 463. The support requirement included 70 sorties totaling 265 tons.

a. The AMC for the troop lift was the S-3, 223d CAB; and the heavy lift was under the control of the CO, 159th Aslt Hel Bn. The planned sequence of movement included completion of the troop lift prior to the first medium and heavy lift aircraft. This would avoid the mixing of UH-1H aircraft with the medium and heavy lift aircraft.

IV-44

CONFIDENTIAL

CONFIDENTIAL

155

The flight route was north of Highway 9 and the Xe Pon River, proceeding on a westerly heading until abreast of the LZ, at which time a left modified high overhead approach would be initiated ending in an upwind landing.

b. Gunship cover in the vicinity of the LZ was under the control of the troop lift AMC, giving him as much flexibility as possible with his fire support. Three sets of guns were given the role of direct support to the 159th elements under mission control of the C&C for that element. The 159th mission commander planned on using the three sets of guns by maintaining two sets on station over the LZ throughout the heavy and medium lift portion of the insertion. The remaining set of guns would be used to relieve alternately the other sets of guns on station. The relief set of guns would be on call at the rearm pad at Khe Sanh, and directly responsive to the C&C.

c. It was decided that one flight consisting of ten aircraft would be used for this operation. This flight of ten aircraft was further divided into six CH-47's and four CH-53's. The Marine element was placed under the control of the Army element which facilitated both control and coordination between these units. The use of one flight combining both the heavy and medium lift aircraft further allowed greater flexibility and mission responsiveness than had been experienced by the 159th in previous operations with the Marine aircraft.

d. Two minute separation between aircraft was considered to be the best separation time. This time was arrived at with due consideration for aircraft separation in the LZ and PZ, while still permitting maximum flight control by the C&C. Heavy emphasis was placed on maintaining proper separation by observing the posted enroute flight air speed of eighty knots and a return air speed of one hundred and ten knots.

e. The formation most logically chosen for the flight was trail, again maximizing control and coordination, while allowing maximum maneuverability and flexibility.

IV-45

CONFIDENTIAL

CONFIDENTIAL

158

The tactical extraction of the fire bases by medium and heavy lift helicopters was completed using the same basic organization, planning and tactics employed during assault support and resupply operations. Medium and heavy lift helicopters were employed during the extraction phase of three of the ARVN fire bases located in Laos and two in South Vietnam. All the fire bases came under some form of ground attack and/or indirect fire at the time of the extraction or just prior to the extractions. Because of enemy contact at the extraction sites, start and completion times were adjusted to meet the tactical situation.

(2) Organization

The organization for each extraction varied based on the amount of equipment to be extracted and the enemy activity around the fire base. The number of aircraft used varied from four to six medium lift helicopters (CH-47) and one to two heavy lift helicopters (CH-54/53). One set of AH-1G or UH-1C gunships provided fire support. The aircraft were all under the command of one mission lead until the extraction was completed. A command and control aircraft was used to coordinate the overall extraction from a position over the fire base.

(3) Planning

Detailed planning was accomplished by the personnel of the battalion forward CP and passed to the mission lead on a daily basis, or mission basis. The briefing of flight crews by the S-3 personnel consisted of intelligence, flight routes, fire support (planned and available on call) and the specifics for breaking off the mission in case of heavy enemy activity. The AMC in the command and control aircraft then monitored the operation and was immediately available to coordinate changes and solve problems. The emphasis in extraction planning was on the preparation of the loads and in keeping the exposure time in the PZ to an absolute minimum.

(4) Tactics

Tactics employed were the same during the extraction phase as those employed during the assault support and resupply phase.

IV-46

CONFIDENTIAL

CONFIDENTIAL

157

f. The aircraft were to remain overnight at their home stations and depart not later than 0700 hours on the morning of the 4th to proceed to an assembly area designated as PZ AIRBORNE (XD 8238). This assembly area was chosen for both its size and close proximity to the PZ's. A closing time of 0930 hours was established for the arrival of all the aircraft at assembly area. At the assembly area it was planned that the C&C would give the mission lead and aircraft crews any last minute mission changes and the latest enemy and friendly situation reports. A check of the aircraft would be made by the crews and the flight would be ready for the expected PZ time of 1100 hours, or could respond to an "on call" order to proceed with the insertion. The exact PZ time at this phase was only speculative, and depended on how well the troop insertion progressed. The remainder of the mission would be accomplished as rapidly as possible. With an estimated turn around time of 45 minutes, the mission would be completed in three lifts and a closing time of 1630 hours was estimated.

g. On the morning of 4 March 1971, all aircraft were enroute to the assembly area by 0700 hours. While enroute to the assembly area, four direct support missions were completed by aircraft assigned to the LOLO operation. All aircraft closed in the assembly area by 0930 hours and the mission was on schedule. In the assembly area the mission lead and the crews received their up-date mission briefing from the C&C. All aircraft were ready to launch by 1030 hours.

h. The C&C then launched to make an aerial reconnaissance of LZ LOLO. While enroute he contacted the AMC and received an air briefing on the latest enemy situation, suggested flight route, approach direction into the LZ, flight altitudes, winds, an artillery advisory, and the current mission status.

i. After receiving the air brief by the AMC, it was evident that the insertion was not progressing as rapidly as planned. The delay in getting the ground elements inserted made it necessary to begin the heavy and medium lift portion of the insertion prior to the last ground unit closing in the LZ. A warning order was passed to the C&C to prepare the first lift for delivery by 1400 hours. This warning order was followed up by an order to execute the heavy and medium lift phase at 1308 hours. The first flight was launched at 1311 hours and proceeded to the LZ.

IV-47

CONFIDENTIAL

CONFIDENTIAL

158

1. The LZ was fairly small and had evidently been prepared by an air-delivered bomb with fuse extension (Daisy Cutter) as there were many stumps and some rather large obstacles left within the perimeter of the LZ. The troop lift aircraft were making their approach from the north to the south with a short left turn and landing in the LZ from the west to the east. They were departing to the east and breaking to the left as they climbed out. It was evident that there would be problems, first in getting in and out of the LZ with all the air traffic, and once in the LZ, finding a suitable area to release the loads. In addressing the second problem, the only solution was to try to keep the loads out of the troop lift landing area to avoid blade strikes. As for the first problem, the troop lift aircraft had to adjust their approaches to integrate them with the troop lift traffic. Once in the LZ, the CH-47 with its sizeable rotor noise was greatly restricted by obstacles while maneuvering to position its load. The CH-53 was even more restricted.

2. The first aircraft arrived and began its descent into the LZ, which was completed successfully with no major incidents. The first loads to arrive were the 105mm and 155mm howitzers. The last aircraft of the first lift closed out on the LZ at 1400 hours. This procedure was followed until the PZ was clean at 1615 hours. The last sortie was completed at 1645 hours, completing the mission.

3. Early in the assault phase while enroute on the first lift, a CH-47, tail #820, took two hits at three thousand feet from a 12.7mm antiaircraft weapon. One round entered the cockpit area through the aircraft commander's window, pierced the bulkhead just above and behind the aircraft commander's head and continued on piercing the #2 upper dual boost actuator and eventually lodged in the spar of the green rotor blade. The second round lodged in the aft red rotor blade spar. The aircraft lost its #2 hydraulics which forced the aircraft commander to drop his load and make an emergency descent, landing at ALUOI. The aircraft commander received minor injuries to the left side of his face and left shoulder caused by flying windshield glass. Later in the operation, the aircraft and crew were evacuated to Khe Sanh.

IV-48

CONFIDENTIAL

CONFIDENTIAL

159

c. Extraction Operations

(1) General

The tactical extraction of the fire bases by medium and heavy lift helicopters was completed using the same basic organization, planning and tactics employed during assault support and re-supply operations. Medium and heavy lift helicopters were employed during the extraction phase of three of the ARVN fire bases located in Laos and two in South Vietnam. All the fire bases came under some form of ground attack and/or indirect fire at the time of the extractions or just prior to the extractions. Because of enemy contact at the extraction sites, start and completion times were adjusted to meet the tactical situation.

(2) Organization

The organization for each extraction varied based on the amount of equipment to be extracted and the enemy activity around the fire base. The number of aircraft used varied from four to six medium lift helicopters (CH-47) and one to two heavy lift helicopters (CH-54/53). One set of AH-1G or UH-1C gunships provided fire support. The aircraft were all under the command of one mission lead until the extraction was completed. A command and control aircraft was used to coordinate the overall extraction from a position over the fire base.

(3) Planning

Detailed planning was accomplished by the personnel of the battalion forward CP and passed to the mission lead on a daily basis, or mission basis. The briefing of flight crews by the S-3 personnel consisted of intelligence, flight routes, fire support (planned and available on call) and the specifics for breaking off the mission in case of heavy enemy activity. The AMC in the command and control aircraft then monitored the operation and was immediately available to coordinate changes and solve problems. The emphasis in extraction planning was on the preparation of the loads and in keeping the exposure time in the PZ to an absolute minimum.

IV-49

CONFIDENTIAL

CONFIDENTIAL

160

(4) Tactics

Tactics employed were the same during the extraction phase as those employed during the assault support and resupply phase. Departures from the PZ's in LZs were at maximum performance to minimize exposure time below 100 feet AGL.

(5) Pickup Zones (PZ)

Because of the enemy situation and the location of extraction PZ's, on forward fire bases, many of the considerations for electing, organizing and operating a good PZ were at a minimum. Those considerations most often disregarded were the normal clear area around the PZ (75 X 150 meters), police of the PZ and air control. Dust was the one problem that most often affected the drop in the PZ during the hook up of loads. The dust was generally inadequate from the pilots' view, and as a result of the enemy barrier; however, the preplanning and coordination employed was sufficient to insure that the loads were rigged and ready, and that hook up personnel were on the loads when the aircraft arrived.

(6) Landing Zone (LZ)

The LZ's for extractions were the same as the LZ's for assault support and resupply operations and required no special preparation or consideration.

(7) Fire Support

The fire support requirements and planning for the extraction phase were generally the same as for the assault support and resupply phase. The assets utilized were all available (TAC air preplanned and/or on call), artillery and helicopter gunships. The emphasis was placed on the preplanned use of TAC air and artillery to attack and suspected indirect fire sources and to generally disrupt and organize the enemy just prior to commencing the extraction. TAC air and artillery were used for the same purpose after the operation was interrupted by enemy direct or indirect fire. The coordination of these fires was accomplished by the AMC from the command control aircraft overhead.

IV-50

CONFIDENTIAL

CONFIDENTIAL

161

f. Routine Resupply Operations

(1) Once the fire bases were established, resupply operations were tailored to meet the individual needs consistent with the tactical situation. Two to six aircraft were placed under the control of a mission leader, usually an assault support helicopter company commander or platoon commander. The aircraft were employed as described in the tactics portions of assault support operations of this paper. Although the landing zones (LZ's) were repeatedly placed under indirect fire, the bases were resupplied. When antiaircraft fire became intense, especially around forward fire bases near Tchepone, resupply operations had to be suspended until the enemy positions were destroyed or the threat reduced to an acceptable level.

(2) Although resupply missions were planned a day in advance, it became apparent that loads would often not be rigged until mid-day on the day the mission was to be conducted. This required that the loads be airlifted to the fire bases during the period of the day when the density altitude was the highest. Pathfinders at the pickup zones (PZ's) controlled aircraft in high density traffic areas and assisted the logistic personnel. Since most resupply was done through a series of closely knit bases around the perimeter of Khe Sanh airfield, the high density of aircraft was a persistent problem. On sorties delivered to landing zones it was planned that loads would be dispersed throughout the site. This prevented indirect fire from destroying complete ammo dumps. This also reduced the vulnerability of the aircraft had they continually landed at one specific place on each site. As time elapsed the fire support bases and landing zones accumulated debris, which proved to be a hazard to helicopters working the area and endangering the safety of ground personnel.

g. Integration of Medium and Heavy Lift Operations With Troop Lift Operations

(1) In the majority of the moves where UH-1H and CH-47 aircraft were used together, planning was accomplished to make each element a separate and distinct part of the move. Normally, the UH-1H portion of the move was completed prior to the start of any medium and/or heavy lift. This facilitated control of lift and gunships.

IV-51

CONFIDENTIAL

CONFIDENTIAL

162

minimized air traffic and airspace problems, and provided elements on the ground in time to make necessary preparations for receiving supplies and equipment.

(2) On those occasions where time was a critical factor and medium lift had to be initiated prior to the completion of the UH-1H portion, the UH-1H aircraft "gave way" to the larger and more cumbersome aircraft. Although this technique did minimize the problems associated with intermingling two such dissimilar aircraft, control was nevertheless a problem. This was primarily a result of insufficient LZ preparations compounding the difficulty in maneuvering large aircraft with bulky external loads. Time in the LZ was thus increased, and exact timing and integration became difficult. Compounding obstacles, such as trees and stumps, was the heavy dust blown about by the high winds associated with large helicopters, causing almost IFR conditions for both UH-1H and medium lift aircraft. Throughout the operation there were only several minor blade strikes and no accident damage.

h. Weather

(1) Weather was an influencing factor on 24 days or 54% of the possible flying periods. During these times, low ceilings and reduced visibility caused delays in flight schedules. On 17 Feb 71 all missions were cancelled because of weather.

(2) Low ceilings compressed the available flying area vertically and laterally, thus causing higher concentrations of aircraft in the useable airspace and, at the same time, bringing the aircraft closer to enemy gunners. Some channelization of flight routes into river valleys also resulted, but weather prevented mission accomplishment only on rare occasions.

i. Communications

(1) General

Communications for the medium and heavy lift elements supporting LAMSON 719 were provided by FM radio, AM radio-teletype and field wire nets that were established, maintained and operated by signal personnel from the 159th Aviation Battalion and the 101st

IV-52

CONFIDENTIAL

CONFIDENTIAL

/63

Aviation Group.

(2) Communications Systems

(a) FM Radio

The primary means of voice communications on this operation was FM radio. Three RT-524 radios were set up at a forward operations tent, providing a battalion secure net, a battalion plain net and a station in the group secure net. The secure capability was achieved by using two KY-8 secure sets. Power for this FM configuration was supplied initially by two 1.5 KW DC generator sets and four 12 volt DC batteries. Later on, because of generator failure and battery problems, a 3 KW DC generator set was used in conjunction with an RA-91C rectifier. A net diagram of the FM radio system is shown at Figure IV-1. The battalion (fwd) plain net was originally designed to communicate with the rear area by means of an FM retrans site. Because of equipment shortages, this retrans site was not installed and bad atmospheric conditions nullified the possibility of communicating to the rear without it. The battalion (fwd) plain net was then used, as was the battalion (fwd) secure net, primarily for contact with aircraft in the area of operations. Aircraft VHF and UHF radios were also employed as required.

(b) AM Radio-Teletype

A long-range radio capability was needed because of the substantial distance separating the forward and rear areas, and because of FM's inherent "line-of-sight" restriction. For this purpose the AN/VSC-2 single-side-band radio was used with a 50 ohm antenna. The equipment was located in a small tent adjacent to the 159th operations tent. It was installed, operated and maintained entirely by personnel of the 101st Group Commo Platoon, and existed for the convenience of the 159th and other units of the 101st Aviation Group. The AN/VSC-2 provided a plain voice capability and a secure teletype means of communicating with the rear areas and with attached battalions (see Figure IV-1). This configuration was generally reliable.

(c) Wire Communications

WD-1 wire and field telephones were used for local land

IV-53

CONFIDENTIAL

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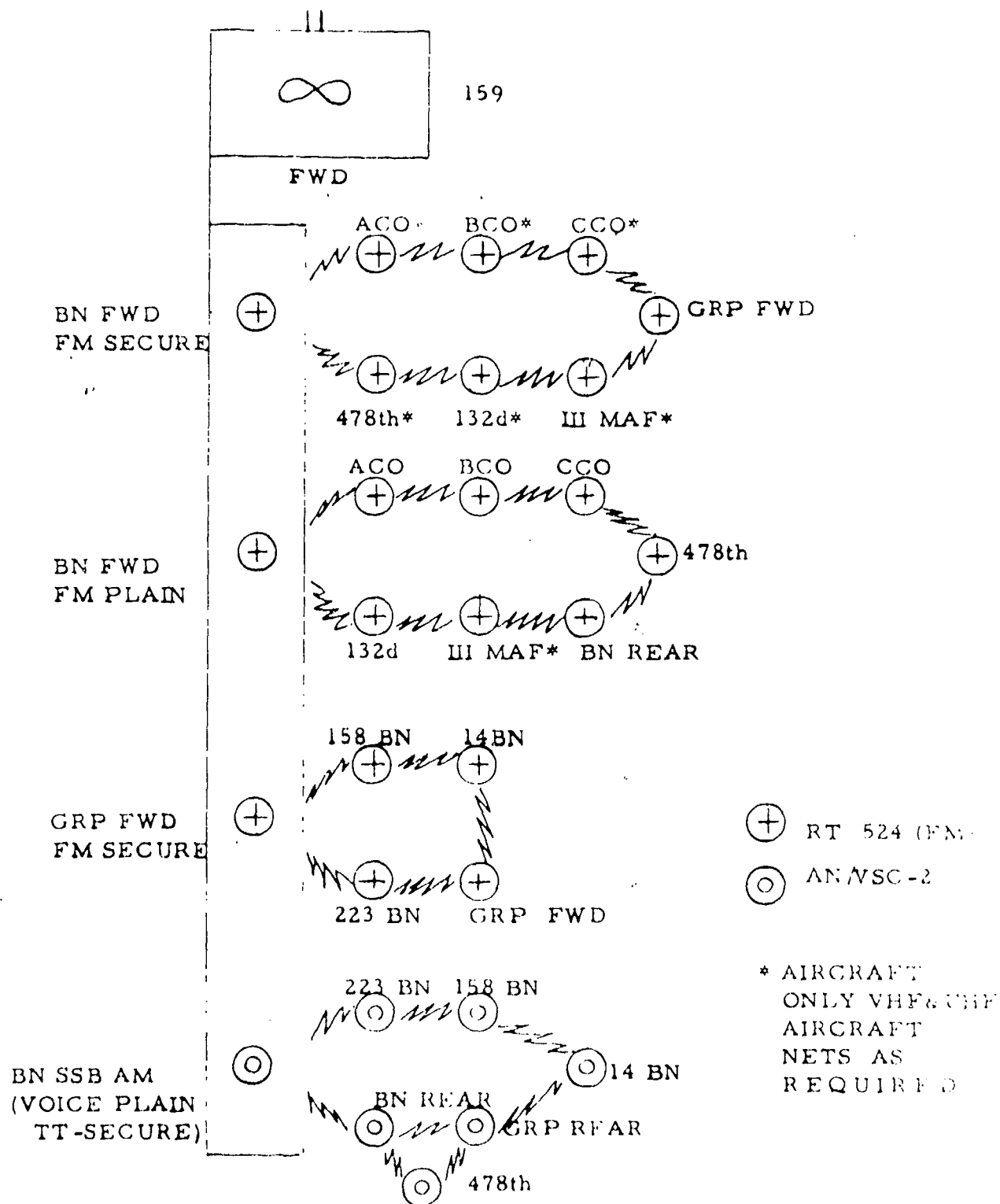


FIGURE IV-1 (U) Radio Net Diagram for 159 Avn Bn (ASHB) (U).

IV-54

CONFIDENTIAL

167

line commo between group and battalion operations tents, a line to the area switchboard, and a line between battalion operations and the commo tent (see Figure IV-2). Equipment was provided by the battalion commo section and personnel from the section were used to maintain it. Wire communications presented no problems.

(3) Personnel Requirements

In the initial phase of setting up and digging in, seven men from the 159th Avn Bn Commo Section were utilized. This process took the majority of two days, with modifications made during the next ten days. After procedures settled down to normal, two or three people were sufficient to handle the signal requirements, as well as distribute and safeguard SOI material.

(4) CO 159th Aviation Battalion Comments

There were no major problems with signal equipment during this operation. At times, power failures and surges caused minor damage to radios and secure equipment, but enough backup equipment was always on hand to restore communications promptly. Power problems occurred because the 1.5 KW generator could not supply adequate power to handle the 28 volt load requirement of the radios with secure sets. Later on, a 3 KW generator was substituted and worked well except for occasional fluctuations in the power level. Finally, a rectifier was obtained which provided constant, steady power to the sets. Overheating, especially in the AN/VSC-2 set, became a problem at times. The lack of sufficient ventilation and extremely dusty operating conditions were major causative factors.

(5) Summary

All things considered, the communications system was more than adequate for this operation. Had better sources of power been available, radio equipment problems would probably not have existed. Secure sets held up much better than expected, considering the heat and dust. Initial installation was fast and efficient. The only major improvement required is in the area of power supplies. Larger, more reliable generators are required to meet the heavy demands of an operations of this type.

CONFIDENTIAL

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169

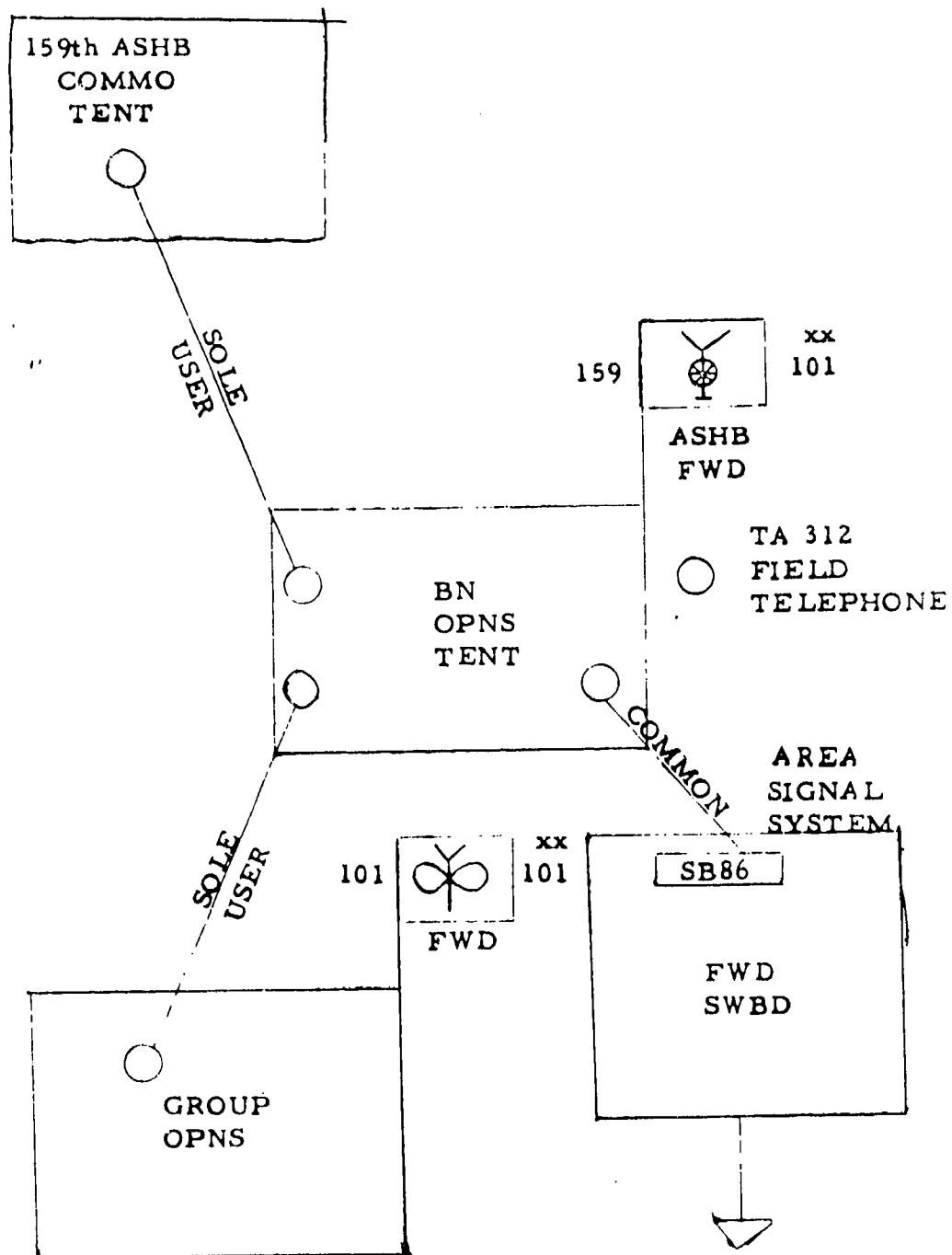


FIGURE IV-2 (U) Wire Diagram for 159th Avn Bn (ASHB) (U)

CONFIDENTIAL

171

j. Maintenance

A major maintenance effort was required to assure continued availability of the large numbers of medium and heavy lift helicopters required to support LAMSON 719. Prior planning, additional support, command emphasis and increased effort were all factors contributing to the achievement of the desired result.

(1) Direct Support Maintenance and Supply

Each of the organic medium and heavy lift companies (A, B, C, 478th HHC of the 159th Assault Support Helicopter Battalion [ASHB]) has a direct support maintenance capability. The three letter companies each has a Transportation Corps (TC) Detachment with direct support capability organic to the company. The 478th Aviation Company achieved this capability through its organic maintenance platoon. The two non-organic medium helicopter companies (132d and 179th) which were OPCON to the 159th ASHB, also had a direct support capability. Repair parts supply support was provided to each of the units, except the 478th Avn Co, by either A or B Company, 5th Transportation Battalion. The 478th Aviation Company received its support in repair parts from the 142d TC Company, 58th Transportation Battalion, located at Red Beach, Da Nang.

(2) Impact of Operation LAMSON 719

The greatly increased flying hour program had a pronounced effect on the combined maintenance effort, since it resulted in a corresponding increase in the amount of scheduled and unscheduled maintenance performed. This sharp increase in monthly flying hours was particularly significant since it occurred immediately after the lull of the monsoon season in northern Military Region I. This had both advantages and disadvantages. It was an advantage in that the units were able to devote more concentrated effort in their maintenance operation during the period immediately preceding LAMSON 719. The major disadvantage, however, was that it was difficult to quickly adjust to a sudden, sharp increase in the flying hour program, particularly in scheduling the aircraft into Preventative Maintenance-Periodic (PMP) inspection. This problem was anticipated and a warning given to the units of the 159th ASHB to prepare for a highly concentrated flying hour program during the period February 1971 through April 1971.

CONFIDENTIAL

This was of particular concern to the three Ch-47 companies of the 159th ASHB, since their scheduling program is of vital importance in projecting future scheduled maintenance. The scheduling program is based on a three month projected flying schedule. Using this scheduling program, time change components with required delivery dates (RDD) are requisitioned through close coordination between the quality control sections and tech supply section. /72

(3) Maintenance Operations

Based on limited information available, each of the letter companies and the 478th Avn Co began preparing for the expected increase in flying hours by adjusting their scheduling program accordingly. In addition, those aircraft which were within 25 hours of their required PMP were flown into the inspection while the high time aircraft were held down, this enabled the units to build a bank of aircraft hours with which to start the operation and sustain themselves without having more aircraft go into scheduled maintenance than they were capable of handling during the initial phase. As the flying hours per company began increasing at the start of the operation, the amount of scheduled maintenance also increased. During the two month period February through March 71, the three letter companies of the 159th ASHB performed 62 PMP inspections, the 132d and 179th ASHB, 28 and the 578th Aviation Company, nine. This was accomplished by using a 24 hour maintenance schedule. This put a severe strain on the manpower available in the maintenance sections of each unit, particularly since assigned strength of the TC Detachments was running at approximately 75 per cent of the companies during this period. This problem was compounded because the shortages were mainly in supervisors, 68 series MOS, and other allied shop personnel. There was a distinct shortage of experienced specialists. The following figure shows shortages against authorized strength by MOS in the 159th ASHB on 27 March 1971 which was characteristic of the manpower situation within the companies throughout the operation:

<u>MOS</u>	<u>AUTH</u>	<u>ASG</u>	<u>SHORT</u>	<u>JOB TITLE</u>
671C	13	6	7	Avn Maint Tech
76T	26	14	12	Tech Supply Spec
67Z50	22	13	9	Maint Supervisor

FIGURE IV-3 (U) Maintenance Personnel Status (U)

IV-58

CONFIDENTIAL

CONFIDENTIAL

173

<u>MOS</u>	<u>AUTH</u>	<u>ASG</u>	<u>SHORT</u>	<u>JOB TITLE</u>
67W	14	9	5	Tech Inspector
35K	17	14	3	Avionics Mech
35L	6	2	4	Avionics Repairman
35M	6	3	3	Avionics Equip Repairman
35N	5	3	2	Avionics Flt Control Repair
44E	4	2	2	Machinist
45J	4	2	2	Aircraft Armament Repair
68B	14	9	5	Engine Repairman
68D	8	6	2	Power Train Repairman
68E	11	8	3	Propeller Repairman
68F	18	11	7	Electrician
68G	25	17	8	Welder
68H	12	8	4	Hydraulic Repairman

FIGURE IV-3 (U) (Continued) Maintenance Personnel Status (U)

The problems caused by these critical shortages were overcome by aggressive cross-training and on-the-job training programs in effect throughout the battalion. In addition, two civilian PMP teams were provided by the 34th General Support Group to assist the CH-47 units in accomplishing scheduled maintenance. These teams consisted of a total of sixteen personnel, and were available to the units from 7 February 1971 through the completion of LAMSON 719. They accomplished a total of twelve PMP inspections on CH-47 aircraft, and contributed 7,515 man hours to the combined maintenance effort. These teams provided needed assistance during this period, easing the problems caused by the manpower shortage in the units and providing a reservoir of valuable maintenance experience. Another area in which these teams assisted was in coping with the increase in the amount of unscheduled maintenance resulting from the conduct of LAMSON 719. The unscheduled maintenance was of two varieties. One consisted of the normal problems associated with a greatly increased flying hour program. The other consisted of the result of battle damage from enemy ground fire. Almost 1000 man-hours were required to repair skin and structural damage inflicted on the CH-47's and CH-54's. Without the availability of the civilian PMP teams many of these repairs could not have been effected utilizing organic maintenance capabilities.

IV-59

CONFIDENTIAL

CONFIDENTIAL

174

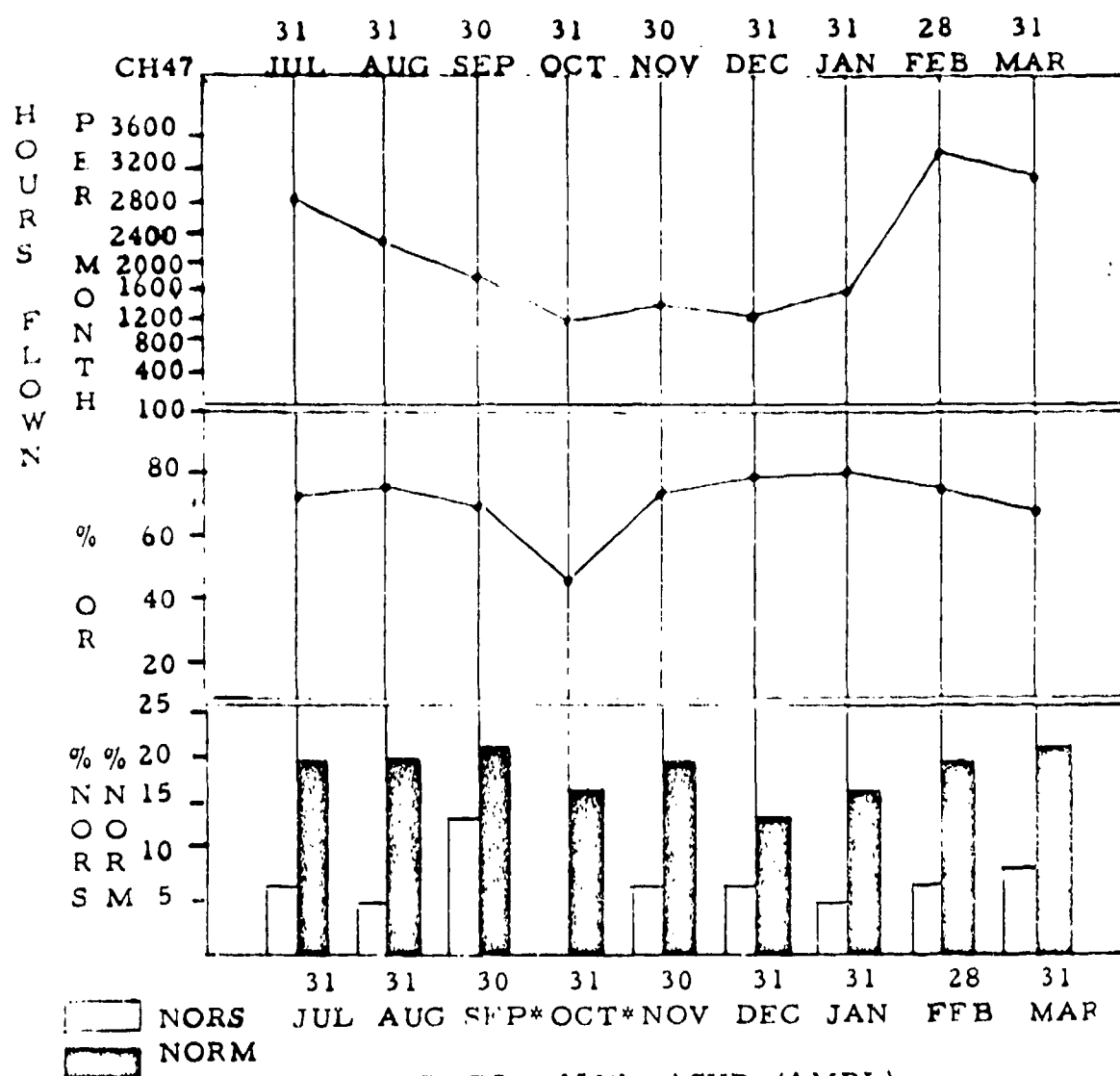
(4) CO, 159th Aviation Battalion Comments

The three primary indicators for determining the efficiency of the maintenance effort during this period were the operational ready rate (OR), and the NORM/NORS rates. At Figures IV-4, 5, and 6 are charts which graphically depict these indicators with relation to the associated flying hour program of the CH-47's and CH-54's. As the flying hour program increased abruptly in February, the NORM rates, and in the case of the CH-47's, the NORS rates, also increased. It is significant to note that the NORS rate, although increasing slightly, remained relatively constant when compared with the previous seven month period. This was due primarily to the amount of command interest and emphasis on the aviation repair parts supply system. A forward liaison element of the 34th General Support Group, operating out of Quang Tri, was in a large measure responsible for insuring that the necessary repair parts were made available to the requesting units in an absolute minimum of time. This element also maintained close liaison with the civilian PMP teams, and determined where their assistance was most urgently required. One of the primary reasons for the light increase in the NORS rates was that some of the repair parts for which there was a sudden demand were items that had acquired little if any demand data in previous operations. Many of the parts damaged by enemy fire were rarely required under normal operating conditions. It must be emphasized at this point, that a major factor in keeping NORS/NORM rates at an acceptable level was the prior planning done by the units of the 159th Assault Support Helicopter Battalion, and the aircraft scheduling program which they used. They were able to adequately forecast, in most cases, the repair parts which would be required based on the increased flying hour program. A major area of concern to the maintenance activities during the operation was the conditions under which the aircraft were operating in the forward areas. The dust in which the CH-47's and CH-54's were forced to operate on a continuous basis was a critical factor in increased wear on engines and rotor blades. As a result of the battalion policy of flushing each CH-47 engine with water after every flying day, the damage to engines remained negligible. The wear on CH-54 engines was also negligible because of their Engine Air Particle Separators (EAPS). Most of the damage done by the dust was to the aircraft rotor blades. The abrasive nature of the dust coupled with the extremely high winds generated by the rotor wash, resulted in abnormally rapid deterioration of the leading

IV-60

CONFIDENTIAL

175

CONFIDENTIAL

A, B, C, CO., 159th ASHB (AMBL)

48 ASSIGNED CH-47's

DEPICTING COMBINED MONTHLY FLYING HOUR
PROGRAM AVG OPERATIONAL READY RATES & AVG
MONTHLY NORM/NORS RATES FOR MONTHS SHOWN
DURING 1970-1971

* DURING THIS PERIOD, THE 159th ASHB WAS
UNDERGOING SUPER "C" CONVERSION

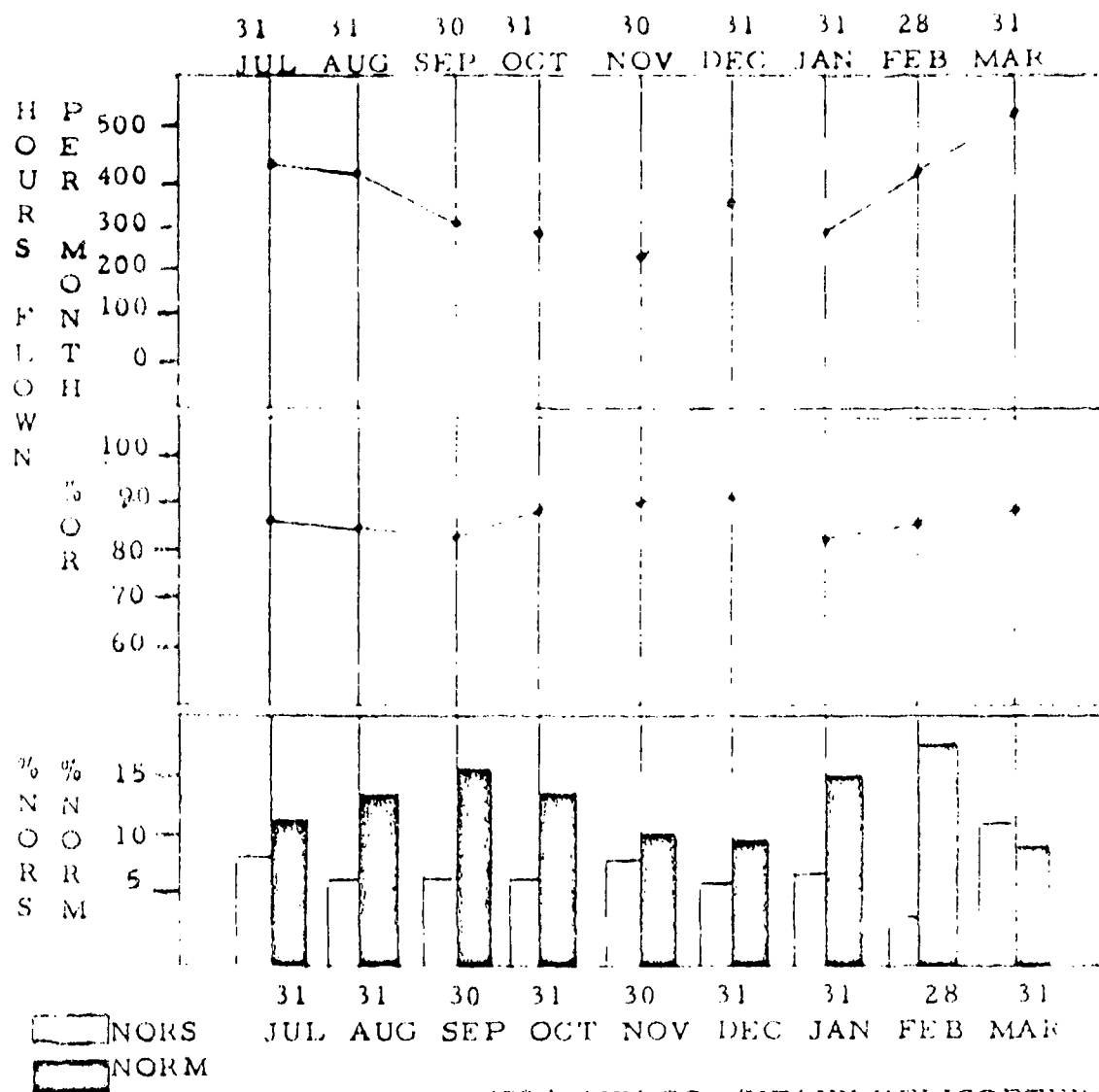
FIGURE IV-4 (U) Monthly Flying Hours, CH-47 (U)

IV-61

CONFIDENTIAL

CONFIDENTIAL

176



478th AVN CO. (HEAVY HELICOPTER)
 159th ASHB (AMBL) 101st ABN DIV (AMBL)
 * ASSIGNED CH-54A'S

DEPICTING MONTHLY FLYING HOUR PROGRAM,
 OPERATIONAL READY RATES & MONTHLY NORMS
 RATES FOR PERIOD SHOWN DURING 1970-1971

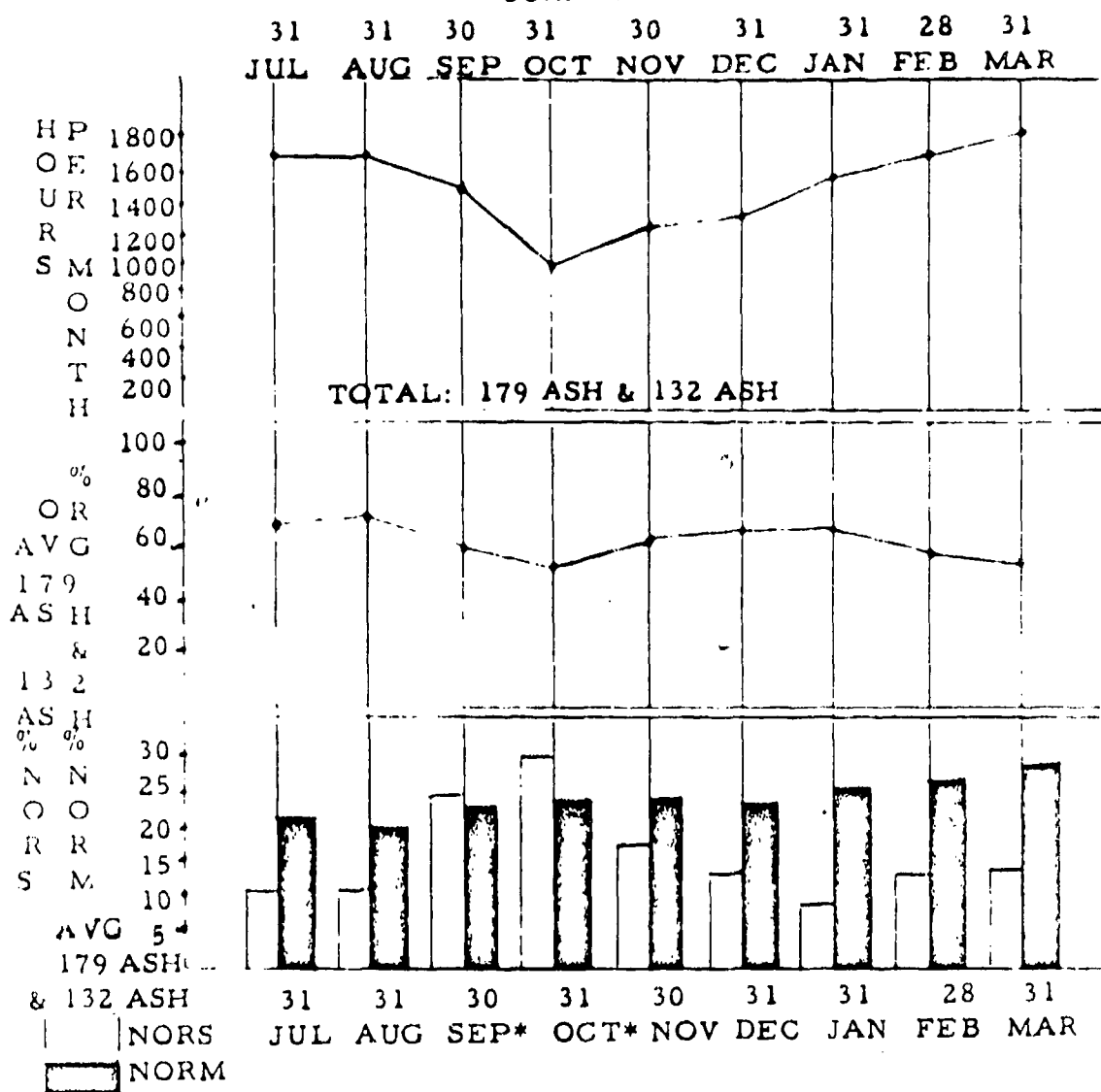
* IN NOV 70 ASSGD A/C INCREASED FROM SEVEN TO
 TEN CH54A'S

FIGURE IV-5 (U) Monthly Flying Hours, CH-54A (U)

IV-62

CONFIDENTIAL

CONFIDENTIAL



* DURING THIS PERIOD
179 ASH CO UNDERWENT
SUPER "C" CONVERSION

179 ASH CO & 132 ASH CO OPCON TO 159 ASHB
(AMBL) 32 ASSIGNED CH47 DEPICTING COM -
BINED MONTHLY FLYING HOUR PROGRAM,
AVG. OPERATIONAL READY RATES & AVG.
MONTHLY NORMS/NORS RATES FOR
MONTHS SHOWN DURING 1970-1971

FIGURE IV-6 (U) Monthly Flying Hours, CH-47 (U)

IV-63

CONFIDENTIAL

CONFIDENTIAL

178

edge of the aircraft rotor blades. The CH-54's were most affected in this area, in that they were forced to replace seventeen main rotor blades. The impact of this problem on the availability rate, and the NORM/NORS rates was very slight since this problem was expected early in the operation and the necessary parts were prestocked or requisitioned in anticipation.

(5) Summary

Based on performance, operational ready rates, and NORS/NORM rates, the various maintenance activities which provided direct support to the medium and heavy lift helicopter companies continued to operate in an efficient manner during the course of LAMSON 719. Numerous problem areas were encountered but were solved either through prior planning and preparation or by making adjustments to alleviate them as they occurred. It is evident that despite the sharp increase in flying hours, the OR percentage remained fairly constant and in the case of the CH-54's, even increased. The NORS and NORM rates remained well within acceptable limits during the two month period of the operation. This flying hour program could have been continued indefinitely, particularly since the original planning and preparation by the respective maintenance personnel was for a time span which was expected to extend beyond the period covered in this report. One situation which continued to be a significant problem area throughout the operation was the difficulty the various maintenance activities encountered in servicing and maintaining aircraft in the forward operational area. When an aircraft encountered a maintenance problem which precluded it from returning to its home maintenance facility, the units' maintenance teams had to provide repair capabilities in the forward areas. Because of the distance between the operational area and the units' rear bases, coupled with an occasional breakdown in communications, this situation resulted in many lost hours on the part of the maintenance support. There were some instances where the information which the maintenance officers received was faulty or incomplete regarding parts needed or problems encountered with a particular aircraft. The 478th Avn Co was most affected by this situation because of the great distance between their maintenance facility (Da Nang) and the operational area. The difficulty in maintaining adequate land line communications compounded the problem for the 478th Avn Company. The advantages that were gained, however, by staging the CH-47's

IV-64

CONFIDENTIAL

179

CONFIDENTIAL

from their home base in the Phu Bai area far outweighed the few problems occasioned by the maintenance difficulties encountered by the aircraft in the forward areas. The other situation which had a detrimental effect on the maintenance effort was the manpower shortage within the maintenance activities. Had the companies been up to TO&E strength, with experienced, well qualified personnel in technical and supervisory positions, the efficiency and effectiveness of the maintenance operations could have been considerably improved.

5. Results

Hours flown	5703.6
Sorties carried	13045
Tons of cargo carried	24618.4
Passengers carried	9990
MEDEVACS carried	1110
Aircraft recovered	
(a) From Laos	51
(b) From Khe Sanh area	208

FIGURE IV-7 (C). 159th Avn Bn (ASH) Support of LAMSON 719 (U).

a. Vulnerability

(1) Aircraft Damaged

During Operation LAMSON 719, a total of 49 medium and heavy lift aircraft were hit, resulting in two CH-47's shot down and destroyed, one CH-47 forced down and later destroyed by ground action, one CH-53 shot down, and one CH-53 crashed while enroute to home base. The cause of this crash was suspected combat damage. A total of 14 CH-47's and seven CH-53's sustained minor damage. Incident damage was sustained by 15 CH-47's, five CH-53's, and one CH-54.

(2) Aircraft Destroyed

The one CH-53 shot down was hit by a mortar round and approximately 20 rounds of small arms fire while hovering over

IV-65

CONFIDENTIAL

CONFIDENTIAL

a load in a landing zone. One of the CH-47's shot down was hit going into a landing zone by an unknown number of small arms rounds, which knocked out the hydraulics causing it to crash and burn. The second CH-47 shot down exploded in mid-air, cause undetermined. The CH-53 listed as destroyed sustained suspected combat damage and was enroute home when the main rotor system failed.

b. Casualties

- (1) Nine men killed in action in the crash of a CH-53.
- (2) Six men missing in action in a CH-47 that crashed in Laos and was not recovered.
- (3) Six men wounded in action. One MEDEVAC, five with minor wounds were treated and returned to duty.

IV-66

CONFIDENTIAL

CONFIDENTIAL

181

H. (C) FIRE SUPPORT

1. Coordination

a. ARVN-US Coordination

(1) I Corps Fire Support Element--
XXIV Corps Fire Support Element

Fire support coordination was planned between I Corps Fire Support Element (FSE) and XXIV Corps Fire Support Element through I Corps Artillery, I Corps G-3, and the United States I Corps Artillery Advisor. Additional coordination by XXIV Corps was planned with the ARVN divisions and brigades through the 108th Artillery Group. Fire support coordination during LAMSON 719 was executed as planned.

(2) ARVN Divisions--108th Artillery Group

The majority of US fire support coordination was conducted by the 108th Artillery Group directly with the ARVN division and separate brigade headquarters. The 108th Artillery Group established a liaison team at each ARVN division and separate brigade headquarters. The Vietnamese likewise established liaison from each division and separate brigade headquarters to the 108th Artillery Group. Decentralized control of fire support assets below Corps level was the general rule throughout LAMSON 719.

b. US--US Coordination

(1) XXIV Corps--108th Artillery Group

Coordination between XXIV Corps and 108th Artillery Group was accomplished with the XXIV Corps FSE planning programs of fires such as flak suppression, and the 108th Artillery Group executing the plans.

(2) 4th Battalion (Aerial Artillery), 77th Artillery--
108th Artillery Group

The 4th Battalion (Aerial Artillery), 77th Artillery (4/77 ARA), established liaison with the 108th Artillery Group when

IV-67

CONFIDENTIAL

CONFIDENTIAL

the 4/77 ARA assumed the mission of general support, reinforcing the fires of the 108th Artillery Group on 8 February 1971. The concept was that all ARA fire requests would be directed through the 108th Artillery Group and in turn be passed to the ARA fire direction center (FDC) through 4/77 ARA liaison officers.

(3) 101st FSE at Khe Sanh

The primary function of the 101st FSE at Khe Sanh was to collect target information from 101st Airborne Division aviation assets involved in LAMSON 719 (e.g. 101st Aviation Group) and to disseminate this targeting data to the 108th Artillery Group.

2. US Army Fire Support

a. Tube Artillery

(1) Mission

The 108th Artillery Group mission was general support, reinforcing the fires of I Corps Artillery. The 108th Artillery Group consisted of the 8th Battalion, 4th Artillery (4x8" and 8x175mm); the 2nd Battalion, 94th Artillery (4x8" and 8x175mm); and B Battalion, 1st Battalion, 39th Artillery (4x175mm), which was under the operational control of the 108th Artillery Group. In addition, fires in Laos could be delivered by the 5th Battalion, 4th Artillery (18x155mm self-propelled), the direct support battalion of the 1st Brigade, 1st Infantry Division (Mechanized) on a supplemental, as required.

(2) Employment

The 108th Artillery Group employed three 175mm batteries and one 8" battery along the Laos-Vietnam border near TABAT, XD715385. The remaining 8" and 175mm batteries were employed in the Khe Sanh area. It was necessary on five occasions to rotate batteries between the Laos-Vietnam border and Khe Sanh area positions for tube changes and hydraulic maintenance. The fires delivered from the four batteries located along the border could be augmented from the Khe Sanh area positions. When necessary,

CONFIDENTIAL

CONFIDENTIAL

183

additional batteries were moved from the Khe Sanh area to border positions.

(3) Fire Requests

Fire requests from ARVN units located in Laos for US support were processed through one of the two established channels. The first channel was from the ARVN unit in Laos to the ARVN division headquarters or separate brigade headquarters. The 108th Artillery Group liaison officer located at each Vietnamese division and separate brigade headquarters received the mission from the Vietnamese and passed it to the 108th Artillery Group FDC. The second channel for fire requests from units located in Laos was directly from the unit requesting fire to a Vietnamese liaison officer from the respective division or separate brigade, located at the 108th Artillery Group Headquarters. The Vietnamese liaison officer then passed the fire request directly to the 108th Artillery Group FDC.

US requests for fire were sent directly to the 108th Artillery Group FDC or fire unit by Air Force forward air controllers (FACS), reconnaissance elements of the 2/17 Cavalry, and aerial observers from the 108th Artillery Group over Laos.

b. Aerial Rocket Artillery

(1) Mission

The 4/77 ARA Battalion was assigned the tactical mission of general support, reinforcing the fires of the 108th Artillery Group with up to two batteries of aerial rocket artillery effective 8 February 1971. Because of maintenance requirements and battle damage, it was necessary to draw upon the assets of all three firing batteries to accomplish this mission.

(2) Requests for fire

(a) A forward fire direction center was established at Khe Sanh, and a liaison officer was sent to the 108th Artillery Group to be prepared to receive fire missions and relay them to the forward fire direction center. The requests from ARVN unit

IV-69

CONFIDENTIAL

CONFIDENTIAL

headquarters for ARA fires were to be sent to an ARVN liaison officer located at the 108th Artillery Group fire direction center. The mission was then to be relayed to the ARA fire direction center through the 4/77 ARA liaison officer.

(b) As the operation progressed, requests for fire support were being received at the 4/77 ARA fire direction center radio directly from the different ARVN unit headquarters. The 4/77 ARA fire direction center accepted and responded to all fire missions and urgent medical evacuation cover missions.

(c) Requests for fire support were also generated by the 101st Aviation Group elements and the 2/17 Cavalry through their reconnaissance efforts. Requests for fire support were answered by the 4/77 for such units requesting fire support using assumed priorities as stated above.

(3) Employment

(a) Aerial rocket artillery is normally employed with a minimum of two AH-1G aircraft, referred to as a section. The nature of the mission dictates how many sections will be used to accomplish the mission. One aircraft is designated the mission commander. The most experienced aviator is habitually the mission commander. However, all aircraft commanders are qualified to assume the position of mission commander should a problem develop with the mission commander.

(b) Aerial rocket artillery aircraft were used for a variety of support missions. Although the primary mission of aircraft configured in the aerial rocket artillery role is to provide an immediate heavy volume of direct fire support, they are also capable of conducting landing zone preparation fires and to a lesser extent performing aerial escort, medical evacuation cover, and reconnaissance. However, it should be noted that there are other aircraft better configured for these specific missions.

(c) The two basic differences between an ARA Cobra and a gunship AH-1G are the armament configuration and the mission on board the aircraft. An ARA Cobra has as its main weapon four XM159C rocket pods. These are 19 tube 2.75 inch rocket pods for a total of 76 rockets per aircraft. The pods are referred to as wing stores. Although the turret system can accommodate 4,000 rounds of 7.62mm machine gun ammunition and 100

CONFIDENTIAL

CONFIDENTIAL

of 40mm grenade ammunition, only 1500 rounds and 150 rounds respectively are loaded aboard the ARA aircraft due to the maximized main armament (2.75" rocket) load. A fuel load allowing the aircraft approximately 1 hour and 45 minutes flight time is likewise dictated by weight limitations.

(d) Conversely a gunship Cobra will usually take on as much fuel as possible because its normal missions (i. e. escort, aerial reconnaissance) require a large amount of fuel and a corresponding loss of rocket armament. The main weapon system for the gunship Cobra is the turret system, and this system will usually be fully loaded. A gunship Cobra will carry a total of 52 rockets in its normal configuration. Based on the reduced ammunition load, an increased fuel load is possible, allowing the gunship Cobra a longer flight time. The fuel load and armament load for both the ARA Cobra and the gunship Cobra are configured in such a way as to enhance the accomplishment of the type mission for which each is best suited.

(e) The total number of hours flown by type mission is shown in Figure IV-8. A record of typical missions received by the 4/77 ARA during the month of February is shown in Figure IV-9.

<u>TYPE MISSION</u>	<u>FEBRUARY</u>		<u>MARCH</u>	
	hours	+ mins	hours	+ mins
LZ Preparations	146	+ 50	130	+ 10
Medevac/Escort/Extractions	51	+ 20	147	+ 30
Downed Aircraft Cover	11	+ 00	24	+ 00
Contact (approximate)	948	+ 45	927	+ 45
Other	46	+ 00	66	+ 00
NOTE: Exact data on the number of missions other than contact which developed into contact is not available.				

FIGURE IV-8 (U). 4/77 ARA Hours Flown by Type Mission for IAMSON 719 (U).

IV-71

CONFIDENTIAL

189

12 Feb 1971, launched one section in support of friendly units in contact vicinity XD4504, expended 140 rockets resulting in 1 killed by ARA (KBARA) and 2x12.7 MG destroyed.

17 Feb 1971, launched one section on a mortar position vicinity XD650410, expended 216 rockets, 500 7.62mm, 100 40mm grenades and flew 3 hours + 40 mins resulting in 4 KBARA.

18 Feb 1971, launched one section in support of resupply for a unit in heavy contact vicinity XD574250, expended 120 rockets and flew 2 hours + 20 mins resulting in 17 KBARA.

20 Feb 1971, launched one section on a contact mission vicinity XD595515, expended 253 rockets and flew 8 hours + 00 mins resulting in 50 KBARA.

21 Feb 1971, launched one section on a contact mission vicinity XD496358, expended 124 rockets, 500 7.62mm and flew 2 hours + 40 mins resulting in 44 KBARA.

24 Feb 1971, launched two sections on a contact mission vicinity XD665265, expended 414 rockets, 400 7.62mm, 300 40mm grenades and flew 12 hours + 00 mins resulting in 18 KBARA and 1x12.7MG destroyed.

25 Feb 1971, launched one section on a contact mission vicinity XD615359, expended 118 rockets, 500 7.62mm, 100 40mm grenades and flew 3 hours + 00 mins resulting in 3 KBARA, 7 bunkers destroyed and 2-82mm mortars destroyed.

27 Feb 1971, launched three aircraft as a heavy section on a contact mission vicinity LZ 30, expended 119 rockets and flew 2 hours + 60 mins resulting in 15 KBARA.

27 Feb 1971, launched one section on a contact mission vicinity XD630270, expended 124 rockets, 100 40mm grenades and flew 3 hours + 00 mins resulting in 15 KBARA and one B40 rocket destroyed.

FIGURE IV-9 (U). Examples of Typical Missions Flown (U).

28 Feb 1971, launched two sections on a contact mission. XD680218, expended 346 rockets, 350 40mm grenades and flew 10 hours + 30 mins resulting in 47 KBARA, 17 AK 47's destroyed and 2 MG destroyed.

28 Feb 1971, launched two sections on a contact mission. XD683218, expended 532 rockets, 1700 7.62mm, 200 40mm grenades and flew 10 hours + 30 mins resulting in 67 KBARA, 1 AK 47 destroyed.

FIGURE IV-9 (continued) (U). Examples of Typical Missions.

CONFIDENTIAL

<u>HOURS/SORTIES:</u>		Total Hours	Total Sorties
		2499 hrs + 20 mins	5132
<u>EXPENDITURES:</u>		2.75 FFAR Expended	40mm Grenades Expended
		49,367	34,289
<u>BOMB DAMAGE ASSESSMENT:</u>		KBARA	Structures Destroyed
		1187	81
		30 Cal. AW Destroyed	Mortars Destroyed
		89	14
		12.7 MG Destroyed	Trucks Destroyed
		37	8
		Secondary Explosions	POL Points Destroyed
		92	2
		Ammo Dumps Destroyed	
		1	
<u>AVERAGE DAILY COMMITMENT:</u>		Average Number Aircraft*	9
		Average Number Sorties	114
		Average Number KBARA	26

* Aircraft committed on a daily basis ranged from 4 - 14.

FIGURE IV-10 (C). Contribution by 4/77 ARA in LAMSON 719 (U).

IV-74

CONFIDENTIAL

CONFIDENTIAL

190

(4) Availability of Aircraft

(a) The assigned mission of the 4/77 ARA specified that the battalion would be prepared to use up to two batteries in support of LAMSON 719, therefore a total of 24 aircraft could be requested to support the operation. This was later modified to require a total of two thirds of the available mission ready assets within the battalion to be used in support of the operation. There was a continuing requirement to support the three organic brigades daily with two AH-1G aircraft each.

(b) The two factors that most significantly affected the availability of aircraft were the increased number of hours flown in support of the operation, requiring increased maintenance to keep the aircraft flyable, and the heavy volume of antiaircraft and small arms fire, requiring more maintenance time to return damaged aircraft to a flyable status.

3. US Air Force, Navy, and Marine Air Support

a. Tactical Air Support

(1) Mission

The tactical air support mission was to provide responsive support to ARVN operations in Laos by using Vietnamese Air Force, United States Air Force, United States Navy, and United States Marine Corps air assets.

(2) Employment

In support of LAMSON 719 the United States Air Force controlled an average of 200 sorties of air daily through HILLSBORO, the United States Air Force airborne command and control center on station over the operational area in a C-130 aircraft. Airborne FACS were used over each ARVN Division or separate brigade area of operations. To provide responsive TAC air support, TAC air was planned to arrive on station every fifteen minutes. Requests for immediate TAC air were passed from the maneuver commander to the airborne

IV-75

CONFIDENTIAL

CONFIDENTIAL

191
FAC. The FAC would pass the request to HILLSBORO which would allocate sorties of TAC air on station or launch TAC air from strip alert. Preplanned missions were requested through standard air request nets.

(3) Responsiveness

The system used for employment of TAC air during LAMSON 719 was designed to assure responsiveness. No target was more than fifteen minutes away from a tactical airstrike, and frequently times of less than fifteen minutes were achieved. Official statistics on tactical airstrikes in support of LAMSON 719 are not available for this report. These figures are to be released through Air Force channels.

b. ARC LIGHTS

ARC LIGHT strikes were employed during LAMSON 719. Detailed information regarding ARC LIGHT employment is beyond the classification of this document and has been omitted.

IV-76

CONFIDENTIAL

193

I. (U) REARM/REFUEL/RIGGING

1. Mission

The mission of the Division Support Command was to establish five rearm/refuel facilities and to provide supervisory personnel and equipment for rigging helicopter external loads.

2. Plan

In coordination with the Commanding Officer, 101st Aviation Group, the location and number of rearm/refuel points was determined. Figures IV-11 and IV-12 depict the locations, operational dates, and number of points established. To effectively accomplish the mission it was necessary to organize specially tailored teams. Figures IV-13 through IV-16 depict the organization of each team and the equipment required. The entire Division Support Command (DISCOM) element was to move by vehicle from Camp Eagle to Mai Loc, dropping off the Dong Ha team at that location. The remainder of the DISCOM element would assist in establishing the Mai Loc site, and gain experience for establishing future sites. Since Mai Loc was scheduled to be closed prior to the opening of Lang Con, the same personnel and equipment were to be used in establishing Lang Con.

3. Facilities

Building and opening the rearm/refuel points was accomplished on the dates required. The method of accomplishing the direct tasks follows.

a. Rearm Points

The rearm points were constructed using earth-filled 2.75 rocket ammunition boxes. A double rearm point was constructed consisting of a central barricade with open rockets pointing into each side. Within each point were three side by side compartments, one for 17 pound HE rockets, one for flechette rockets, and one for 10 pound HE rockets. This large storage capacity was deemed necessary since it was anticipated that as many as six gunships

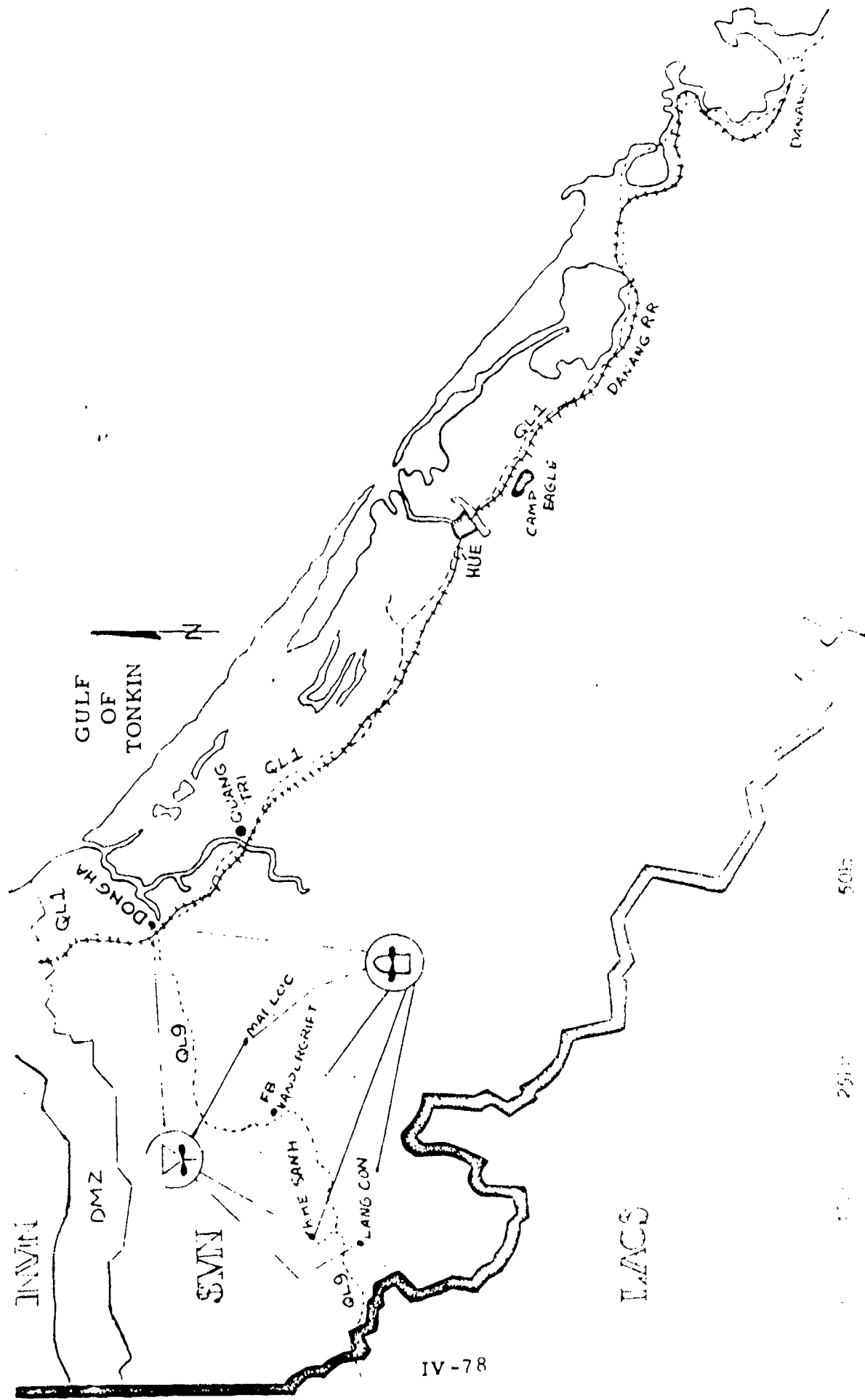


FIGURE 1-11-100 ROUTE/TROOP MOVEMENT

175

<u>Date Operational</u>	<u>Location</u>	<u>Number & Type Refuel Points</u>	<u>Number of Rearm Points</u>
21 Jan 71	Dong Ha	10 Utility/Gun	10
23 Jan 71	Mai Loc	10 Utility/Gun 4 CH-47 - 1 CH-54	10
1 Feb 71	Vandergriif	8 Utility/Gun 1 CH-47 - 1 CH-54	10
2 Feb 71	Khe Sanh	10 Utility/Gun 6 CH-47 - 2 CH-54	10
3 Feb 71	Lang Con	10 Utility/Gun	6

FIGURE IV-12 (U). Planned Rearm/Refuel Points (U)

Personnel

<u>Title</u>	<u>Rank</u>	<u>Number</u>
NCOIC (POL NCO)	E6	1
Ammo NCO	E5	1
Ammo Hdlr	E4/E3	9
POL Hdlr	E4/E3	2
Forklift Opr (Ammo Hdlr)	E3	1

Equipment

<u>Nomenclature</u>	<u>Quantity</u>
Refuel System - 10 Pt	1
Forklift, R/T 6,000 lb	1

FIGURE IV-13 (U). Team Organization (Dong Ha) (U)

199

Personnel

<u>Title</u>	<u>Rank</u>	<u>Number</u>
NCOIC (Ammo NCO)	E6	1
POL NCO	E6	1
Ammo Hdlr	E4/E3	9
POL Hdlr	E4/E3	5
Lt Trk Dr (Ammo Hdlr)	E3	4
Forklift Opr (Ammo Hdlr)	E4	1

Equipment

<u>Nomenclature</u>	<u>Quantity</u>
Trk, Cargo, 1/2 T (Mule)	4
*Forklift, R/T 4,000 lb	1
Refuel System - 10 pt	1
Bag, Collapsible, Water 250 Gal	1
Tent, GP Med	2
Radio AN/PRC-25	1
*Forklift Remained at Khe Sanh	

FIGURE IV-14 (U). Team Organization (Mai Loc/Lang Comm Co)

Personnel

<u>Title</u>	<u>Rank</u>	<u>Number</u>
OIC	CW2	1
Ammo NCO	E5	1
POL NCO	E5	1
Rigger NCO	E6	1
Ammo Hdlr	E4/E3	10
POL Hdlr	E4/E3	5
Acft Recovery Sp	E5/E4	2
Rigger	E4	3
Forklift Opr (Ammo Hdlr)	E4	1
Lt Trk Dr (Ammo Hdlr)	E3	1
Lt Trk Dr (2 1/2 T)	E4	3
Aidman	E4	1

Equipment

<u>Nomenclature</u>	<u>Quantity</u>
Trk, Cargo, 2 1/2 T	3
Trk, Utility, 1/4 T/Radio	1
Forklift, R/T 6000 lb	1
Refuel System - 10 Pt	1
Radio, PRC-25	1
Bag, Collapsible, Water, 250 Gal	1
Tent GP Med	2
Cot, Folding	30
Recovery Kit - OH-6A	1
Recovery Kit - UH-1H/AH-1G	1
Rigging Equipment	*
*Rigging Equipment for 2 Inf Bn's, 2 Arty Bn's, and 50 Tons/day.	

FIGURE IV-15 (U). Team Organization (Vandergriff) (U)

199

Personnel

<u>Title</u>	<u>Rank</u>	<u>Number</u>
OIC	CW2	1
Ammo NCO	E6	1
Asst Ammo NCO	E5	1
POL NCO	E5	1
Rigger NCO	E5	1
Ammo Hdlr	E4/E3	9
POL Hdlr	E4/E3	5
Acft Recovery Sp	E4	2
Rigger	E5/E4	3
Forklift Opr (Ammo Hdlr)	E4	1
Lt Trk Dr (Ammo Hdlr)	E4	1
Aidman	E4	1
Lt Trk Dr (2 1/2 T)	E4	2
Hvy Trk Dr	E5	1
Mechanic	E5	1

Equipment

<u>Nomenclature</u>	<u>Quantity</u>
Trk, Cargo 2 1/2 T	2
Tractor, 5 T	1
Trailer, Stake & Flat	1
Trk, Utility, 1/4 T/Radio	1
Forklift, R/T 6,000 lb	1
Refuel System - 10 Pt	1
Bag, Collapsible, Water, 250 Gal	1
Tent, GP Med	2
Jug, Water, 5 Gal	2
Cot, Folding	32
Recovery Kit - OH-6A	1
Recovery Kit - UH-1H/AH-1G	1
Rigging Equipment	*
*Rigging Equipment for 2 Inf Bn's, 2 Arty Bn's, and 50 Tons/Day.	

FIGURE IV-16 (U). Team Organization (Khe Sanh) (U)

would need to rearm at each point before the ammunition crew would have the opportunity to refill the point. When completed, each point provided some overhead cover and barricading on the three sides of the rocket stacks. Each compartment was divided in half horizontally and the rockets were kept in fiber containers to keep the crushing weight of the rockets off the lower rocket motors. Storage for 20/40mm and 7.62 mini-gun ammunition was provided to the rear of the rearm point. The design and construction of these rearm points resulted from the ingenuity of the assigned ammunition personnel. Specific parking pads had to be conspicuously marked to insure that aircraft did not have blade strikes. Sand bags were found to be satisfactory to mark the pads. A forklift was required to move the vast quantities of palletized ammunition, and engineer work was necessary to dig storage pits and level the area.

b. Refuel Points

The construction of refuel facilities also required engineer support. The 10,000 gallon collapsible bladders were placed inside deep berms. These berms had to be deep enough to hold the bladders in case they burst, and to contain fires if the berm was hit by rockets or mortar fire. Extensive leveling was accomplished to make the refuel pads operational. Collocated with the refuel facility was the rigger hookout and receiving pad. The receiving pad for the receipt of JP4 by heavy lift aircraft carrying 500 gallon blivets also needed to be level and smooth. The refuel systems assembled for this operation were obtained by drawing on the onhand refuel systems located within the normal area of operations of the division. This reduced the number of points which had been established at the various refuel locations. A 10 point rapid refueling system was requested; (see Figure IV-17) however, this equipment did not arrive. The system used was satisfactory and met the needs for aircraft refueling. POL handlers were required to be on site while helicopters were refueling to insure that major items of equipment such as pumps and filter separators were operational.

4. Resupply

There were three methods of resupplying the refuel points: 500 gallon blivets delivered by heavy lift helicopter, JP4 tanker trucks, and USAF C-130 JP4 "Bladder Birds". A combination of all

2c

ITEM	FSN	NO REQ'D
Tank, fabric, collapsible, petroleum products, 10,000 gal cap	5430-292-7212	4
Pumping, assembly, flammable liquid, gasoline engine driven, trailer mounted, 4 in, 350 gpm, 150 psi	4320-691-1071	1
Filter separator, liquid fuel, 300/350 gpm, 150 psi, 4 in inlet, 4 in outlet	4330-017-8790	1
Fitting assembly H (flanged type) c/o one 4 in coupling halves, male, one coupling half, female and one 4 in Y fitting w/dust caps and plugs	4730-075-2407	1
Fitting Assembly B (flanged type) c/o one 4 in gate valve, one 4 in coupling half male, and one 4 in coupling half female	4730-075-2404	2
Reducer, 4 in coupling half female 3 in coupling half male	4730-075-2423	2
Fitting assembly BB, c/o one 3 in coupling half female, one 3 in coupling half male, one 1 1/2 in coupling half male, one 3 in gate valve and one 3 in tee w/dust caps and plugs	4730-075-2409	10
Nozzle, 1 in with female quick-coupling half and dust cap	4930-360-0611	10
Hose assembly, suction, 4 in ID 12 ft long	4720-083-0044	9
Hose assembly, discharge, 4 in ID 50 ft long	4720-083-0046	2
Hose assembly, discharge, 4 in ID 25 ft long	4720-083-0047	2
Hose assembly, suction, 3 in ID 12 ft long	4720-083-0045	16
Hose assembly, discharge, 3 in ID 12 ft long	4720-083-0048	14
Hose assembly, discharge, 1 1/2 in ID 25 ft long	4720-079-4771	20

* In addition to the items shown above, supplementary ground cables and rods, fire extinguishers for each point and the pump, protective goggles and gloves, explosion-proof flashlights and two airfield emergency runway light sets are required. For further details, pertaining to these components of the Fuel System Supply Point, refer to TM 10-4930-203-13.

FIGURE IV-17 (U). Equipment List, 10 Point Rapid Refueling System

three methods kept the refuel points resupplied effectively during the operation. Dong Ha, Mai Loc, and Vandegrift were effectively resupplied by 5,000 gallon and 1,200 gallon tankers from the Da Nang Support Command. The road net was suitable for these vehicles and pumping fuel directly from them into the 10,000 gallon bladders caused no problems. Resupplying Khe Sanh was difficult initially because of the requirement to deliver all fuel by blivets. Emptying the 500 gallon blivet proved to be a tedious, time consuming operation since each one is decanted by a 100 gallon per minute pump. This problem was evident based on the average daily issue of 61,620 gallons of fuel at Khe Sanh from 1 March to 24 March. Each CH-53 aircraft was capable of carrying two external blivets, while the CH-53 and CH-54 could double that payload. The blivet is so constructed that in actuality only 400 gallons of JP4 could be loaded. The USAF C-130 JP4 transporter commenced operation on 17 February. Its payload is rated as 4,000 gallons, but actual payload fluctuated between 2,500 gallons and 3,700 gallons. A summary of fuel delivered by this method from 17 February to 8 March is at Figure IV-18. JP4 tankers did arrive at Khe Sanh and did reduce the amount of fuel required to be lifted by helicopter. Resupply of Lang Con was accomplished by 1200 gallon tankers which drew their fuel from Khe Sanh.

5. Air Items

DISCOM was tasked to provide supervisory personnel and equipment for rigging helicopter external loads. Based on the RVNAF units participating in LAMSON 719 and the known requirement for resupplying and moving artillery and heavy equipment by helicopter, a request was submitted for the air items as shown in Figure IV-19. Riggers from DISCOM moved daily to the RVNAF rigging sites and checked all loads to insure that proper procedures had been followed. They assisted and advised as required.

6. CO 101st DISCOM Comments

a. Rearm/Refuel Points

(1) In order to build and operate these points several items of equipment are required. Engineer bulldozers, graders, and prime movers are paramount. The ground must be level and

<u>Date</u>	<u>Number of Aircraft</u>	<u>Number of Gallons</u>
17 Feb	1	2,500
18 Feb	4	14,864
19 Feb	16	58,130
20 Feb	5	18,616
21 Feb	7	24,716
22 Feb	11	40,876
23 Feb	14	51,226
24 Feb	5	18,618
25 Feb	9	33,408
26 Feb	0	0
27 Feb	9	33,208
28 Feb	11	41,156
1 Mar	16	58,054
2 Mar	5	18,618
3 Mar	9	33,450
4 Mar	6	22,275
5 Mar	13	39,088
6 Mar	13	39,124
7 Mar	1	3,716
8 Mar	0	0

FIGURE IV - 18 (U). Class III A, C-130 Receipts
Khe Sanh (17 Feb - 8 Mar) (U).

FSN	Short Nomenclature	30		4		3		2		3		Loss Damage Contingency	Total
		Inf Bn		105 Bn		155 Bn		Engr Bn		Sig Bn			
1670-753-3788	Sling, 3 loop 3'	990		252		330		48		45		100	1765
1670-753-3630	Sling, 3 loop 8'	0		0		0		12		0		0	12
1670-823-5040	Sling, 3 loop 11'	360		104		252		16		24		75	831
1670-823-5041	Sling, 3 loop 12'	360		190		30		24		12		65	665
1670-823-5042	Sling, 3 loop 16'	180		40		72		40		32		36	400
1670-823-5043	Sling, 3 loop 20'	1260		240		222		40		0		175	1937
1670-090-5354	Clevis, Lg	120		100		398		72		0		65	735
1670-860-0304	Clevis, Sm	240		80		60		24		48		45	497
1670-678-8562	Clevis, Med	180		200		60		24		0		45	509
1670-783-5988	Type IV Link	990		252		330		48		45		165	1830
1670-902-3080	Sling Multi-leg	30		20		75		150		9		25	309
3940-892-4374	Net Rope	0		0		0		0		0		0	0*
3940-892-4374	Net Nylon	240		152		270		44		0		70	776**
3940-298-3985	Net Paulin	0		60		72		24		0		15	171
1670-587-3421	A-22	0		104		15		0		0		10	129
8305-268-2411	80 lb ctn webbing	30		8		6		4		3		5	56
1670-360-0540	15' tie down	300		100		75		50		0		52	577
1670-360-0310	friction adapter	300		100		75		50		0		52	577
2990-360-0210	Load Binders	300		100		75		50		0		52	577
8305-223-1270	Ctn Duck	30		4		3		4		0		5	46

* Rope net is 10,000 lb cap - Nylon net is 5,000 lb cap
 ** A-22 (1670-587-3421) may be issued H.O (2 ea for 1 nylon net)

as free of dust and dirt as possible to allow helicopters to land. Berms must be built for bladders and ammunition storage facilities. Penetration is absolutely necessary in all areas where helicopters operate, not only to reduce external dust but also to reduce dirt and dust entering the helicopter itself.

(2) The 3,600 pound forklift is inadequate in operations of this type. The 6,000 pound rough terrain forklift performed the mission of moving ammunition and blivets in a most outstanding manner. Without it, it would have been impossible to meet the requirements. The 6,000 pound forklift must be reconfigured for the airmobile division so that it can be easily disassembled and moved externally beneath the organic heavy lift helicopter.

(3) The 10 point rapid refuel system (Figure IV-17) should be considered as TOE for the Airmobile Division. It can be put into operation within 12 hours and is compact and deliverable by heavy lift helicopter.

b. Air Items

In planning for an airmobile operation one of the most important considerations is the large requirement for air items. Air items are required for the movement of artillery, infantry, engineer, and signal battalions, logistic resupply to forward tactical units, and air movement of all types of supplies. The requirement for air items is influenced by the tactical situation as it affects air item recovery and backhaul. Experience in Operation LAMSON 719 indicates that more than 50 per cent of all air items used in an airmobile operation are not recovered.

CONFIDENTIAL

207

J. (C) MEDICAL EVACUATION

1. Mission

The XXIV Corps plan tasked the Medical Command (MEDCOM), to provide air ambulance (Dustoff) coverage for LAMSON 719 with the 101st Airborne Division (Airmobile) supplementing as required.

2. Plan

The division plan placed two 101st Abn Div (Ambl) air ambulance helicopters (Eagle Dustoff) under the operational control of the 101st Aviation Group. These aircraft were to provide combat assault coverage and combat medical evacuation of downed US crews in Laos. These aircraft were to be stationed at Khe Sanh. The MEDCOM aircraft from the 571st and 237th Helicopter Ambulance Detachments were also to be stationed at Khe Sanh, but operating under XXIV Corps Control with the mission of combat medical evacuation of ARVN forces.

3. Operations

On 8 March 1971 the 571st and 237th Helicopter Ambulance Detachments (MEDCOM) were placed under the operational control of the 101st Abn Div (Ambl). Since all of the helicopter evacuation assets in Military Region I had been placed under its control, the 101st Abn Div (Ambl) responsibility was expanded to include combat evacuation, combat assault coverage, some patient transfer, and some administrative missions for all of Thua Thien and Quang Tri provinces and for Laos. At this time the two Eagle Dustoff helicopters reverted from the operational control of the 101st Aviation Group to their parent unit. The 237th was further placed OPCON to the 571st Detachment with the CO, 571st Detachment in control of all MEDCOM assets. The medical evacuation mission was stated so that the MEDCOM units continued to have primary responsibility for support of ARVN personnel. Eagle Dustoff was given primary responsibility for support of US personnel to include combat assault coverage. Helicopters from both the 101st Abn Div (Ambl) and MEDCOM units were field sited at Khe Sanh and Quang Tri. (A minimum of five helicopters was established at Khe Sanh, and six at Quang Tri). The concept of the rearward echelon evacuating from the forward echelon was implemented in order that the

CONFIDENTIAL

CONFIDENTIAL

208

assets at Khe Sanh would be maintained at the prescribed minimum level. Because of this policy, there was generally an additional helicopter at Khe Sanh from Quang Tri assets for backhaul of patients from B Medical Company, 1st Bde, 5th Inf Div (Mech) to 10th Surgical Hospital at Quang Tri. An operations officer was designated for each of the two field sites, responsible to the CO, DISCOM through the CO, 326th Medical Battalion. These officers controlled the operations of both 101st Abn Div (Ambl) and MEDCOM helicopters at each of the field sites. They also coordinated the backhaul of patients out of Khe Sanh.

4. Coverage of Combat Assaults (CA's)

Combat assault coverage throughout the operation was the exclusive responsibility of the air ambulance platoon, 326th Medical Battalion. Combat assault missions were passed to the Dustoff aircraft at Khe Sanh in one of two ways:

a. When notified by the 101st Avn Gp of a combat assault briefing, the Dustoff operations officer would attend the briefing and receive the mission.

b. When Dustoff was not notified of the CA briefing, the Air Mission Commander would, by radio, request Dustoff aircraft and brief the Dustoff aircraft commanders in the air. Various methods of CA coverage were employed by Dustoff aircraft commanders. These methods involved the placement of the aircraft in relation to the PZ's and LZ's to give the best reaction time to downed aircraft. The following factors affected the Dustoff aircraft location over the lift:

- (1) Size of the PZ and LZ
- (2) Security of the PZ and LZ
- (3) Distance between the PZ and LZ
- (4) The number of lift aircraft taking part in the CA

c. The aircraft committed to cover the combat assaults were tasked with the mission of picking up downed aircraft crews. These

IV-91

CONFIDENTIAL

CONFIDENTIAL

Dustoff aircraft did, however, make pickups for ground elements in the area of the assault whenever the urgency of the patient involved so dictated. Figure IV-20 depicts the missions flown by the Eagle Dustoff. It should be noted that the number of patients picked up is much lower than the number of sorties. This can be accounted for by the fact that on a number of combat assaults there was no requirement for patient evacuation although the Dustoff aircraft was airborne. Additionally, on a number of occasions, lift aircraft in a formation followed a downed aircraft into the LZ and picked up wounded or injured crew members. At Figure IV-21 are the missions performed by the MEDCOM Dustoff, accounting for over 3900 patients evacuated.

5. Gunship Support

Gunship coverage of Dustoff aircraft picking up downed crews was provided by one of the fire teams escorting the combat assault. Gunship coverage for medical evacuation missions launched from Khe Sanh was requested by the 101st Avn Gp. Two teams were available during daylight and one at night. These missions were flown principally in support of ARVN forces. Gunship coverage for medical evacuation missions launched from Quang Tri to pickup sites west of the 02 NS grid were provided by the unit requesting the medical evacuation. These missions were flown principally in support of US forces. In addition, one fire team was dedicated exclusively to Dustoff operations at Dong Ha by the 101st Avn Gp. During LAMSON 719, a much greater percentage of missions required gunship coverage than had been required in previous operations. This was particularly true of missions into Laos where virtually every mission was flown into an insecure LZ.

6. Backhaul of Patients

The evacuation of ARVN patients from their forward hospital at Bach Son to the ARVN hospital at Dong Ha was accomplished with CH-47 aircraft. This mission requirement, originated with the XXIV Corps Surgeon and through command channels, was given to the 101st Avn Gp. The backhaul missions were scheduled 24 hours in advance. They originated with the US advisors at the ARVN hospital in Bach Son and were transmitted directly to the 101st Avn Gp, which tasked the aircraft involved. The evacuation of US patients located in the clearing company at Khe Sanh to the 18th Surgical Hospital at Quang Tri was accomplished

IV-92

CONFIDENTIAL

CONFIDENTIAL

<u>Date</u>	<u>No of CA's</u>	<u>No of MEDEVACS</u>	<u>No of Patients</u>	<u>Sorties</u>
28 Jan THRU 4 Feb	0	0	0	0
5 Feb	1	0	0	5
6 Feb	0	0	0	0
7 Feb	0	0	0	0
8 Feb	1	2	18	37
9 Feb	0	0	0	2
10 Feb	3	2	3	29
11 Feb	3	0	0	17
12 Feb	4	1	1	21
13 Feb	3	4	4	37
14 Feb	0	9	31	45
15 Feb	2	1	6	18
16 Feb	1	4	21	41
17 Feb	0	1	1	14
18 Feb	1	6	10	35
19 Feb	1	5	13	40
20 Feb	1	3	2	45
21 Feb	2	6	11	25
22 Feb	1	1	9	9
23 Feb	0	3	1	13
24 Feb	2	2	10	29
25 Feb	3	2	7	22
26 Feb	2	0	0	16
27 Feb	1	2	2	12
28 Feb	2	0	6	21

FIGURE IV-20 (C). Recapitulation of Missions by Eagle Dustoff (U).

CONFIDENTIAL

<u>Date</u>	<u>No of CA's</u>	<u>No of MEDEVACS</u>	<u>No of Patients</u>	<u>Sorties</u>
1 Mar	2	0	0	26
2 Mar	2	0	0	31
3 Mar	2	0	15	20
4 Mar	2	0	5	21
5 Mar	1	2	10	31
6 Mar	1	2	2	19
7 Mar	0	0	0	0
8 Mar	0	0	0	0
9 Mar	0	4	13	29
10 Mar	0	4	11	20
11 Mar	1	6	7	38
12 Mar	0	6	7	27
13 Mar	0	4	5	32
14 Mar	0	1	7	17
15 Mar	0	8	26	68
16 Mar	0	8	4	65
17 Mar	2	8	12	35
18 Mar	2	10	25	64
19 Mar	5	9	20	65
20 Mar	2	6	27	44
21 Mar	0	7	22	104
22 Mar	0	7	21	23
23 Mar	0	11	30	53
24 Mar	0	2	16	10

FIGURE IV-20 (C). (Continued) Recapitulation of Missions by
Eagle Dustoff (U).

IV-94

CONFIDENTIAL

CONFIDENTIAL

Date	No of MEDVAX'S	No of Patients	Score
8 Feb	18	66	20
9 Feb	18	62	32
10 Feb	18	61	36
11 Feb	24	131	48
12 Feb	14	75	140
13 Feb	10	110	100
14 Feb	11	62	42
15 Feb	14	66	28
16 Feb	23	36	40
17 Feb	7	15	14
18 Feb		11	32
19 Feb		30	42
20 Feb	12	17	24
21 Feb	11	17	32
22 Feb	7	11	34
23 Feb	19	40	36
24 Feb	21	142	62
25 Feb	15	24	30
26 Feb		11	24
27 Feb	13	11	32
28 Feb	2	90	31
1 Mar	41	71	82
2 Mar	34	121	108
3 Mar	33	112	86
4 Mar	32	79	104
5 Mar	26	63	40
6 Mar	17	62	34
7 Mar	25	55	70
8 Mar	26	159	72
9 Mar	19	145	58
10 Mar	18	136	56
11 Mar	21	110	42
12 Mar	20	76	60

CONFIDENTIAL - Accumulation of Assessments by MEDVAX, Dec 1971

1971

CONFIDENTIAL

CONFIDENTIAL

<u>Date</u>	<u>No of MEDEVACS</u>	<u>No of Patients</u>	<u>Sorties</u>
13 Mar	27	77	54
14 Mar	21	82	42
15 Mar	19	119	38
16 Mar	17	116	72
17 Mar	19	103	58
18 Mar	22	72	44
19 Mar	32	100	64
20 Mar	27	176	54
21 Mar	20	181	60
22 Mar	31	195	82
23 Mar	26	131	72
24 Mar	23	82	66

FIGURE IV-21 (C). (Continued) Recapitulation of Missions by
MEDCOM Dustoff (U).

CONFIDENTIAL

CONFIDENTIAL

214

using North Dustoff aircraft. Prior to 8 March 1971, the aircrafts used were launched from Khe Sanh. After this date one Dustoff aircraft, specifically designated for this mission, was launched from Quang Tri to stand by at the clearing company in Khe Sanh during daylight hours.

IV-97

CONFIDENTIAL

CONFIDENTIAL

B. (C) DOWNED CREW RECOVERY

1. General

Previously, the recovery of a downed crew had been the responsibility of the Air Mission Commander (AMC). With the many aircraft power and assets involved in a mid-intensity warfare environment, the AMC can no longer divert his attention to the recovery effort due to the number of other responsibilities he has. This situation requires that a formal plan for crew recovery be developed prior to initiating an operation. Subordinate commanders, capable of directing large operations, must be designated, and assets in the form of recovery gear and crews must be preplanned, on station, and available to the individual designated as responsible for downed crew recovery.

2. Timeliness

Initially, timely recovery of a downed crew was an ad hoc function of the initiative and responsiveness of individual aviators, directed by the AMC. As the operation progressed it was necessary to designate specific aircraft and crews for the purpose of accompanying each flight and providing the immediate reaction capability of ascending and extracting the downed crews. It was found that the difficulty of extracting a downed crew was almost directly proportional to the period of time the personnel were on the ground. Previous policy required the downed crew to secure their aircraft until an attempt to recover them could be initiated. With the enemy's ability to react and maneuver forces into and around downed aircraft sites, it became imperative that the crew be picked up by a rescue helicopter almost as soon as they could exit their aircraft. In many cases the crews came under direct enemy fire shortly after exiting their aircraft.

3. Designated Aircraft

It was apparent that the AMC could not respond to downed crew rescue utilizing the aircraft at his disposal. Using assets out of the lifting force has a detrimental effect on mission accomplishment. It became necessary to designate aircraft for the sole purpose of aircrew recovery. These recovery or chase aircraft were placed

CONFIDENTIAL

CONFIDENTIAL

216

under the control of an Air Mission Commander for crew recovery operations. A crew recovery aircraft normally flew above and behind those aircraft he was assigned to monitor and was thus able to effect an immediate recovery attempt. The AMC for recovery operations must be experienced and capable of running a large scale operation since what often started as a single ship extraction of a downed crew sometimes became a large scale operation using artillery, TAC air and cav assets. Company commanders and battalion commanders not involved in the tactical operation proved to be the best qualified individuals to perform the duties of AMC for crew recovery operations. The number of aircraft used for chase was determined by an evaluation of the enemy situation along the flight route and in the area of intended landing. The number of chase aircraft varied from one per ten aircraft to a maximum of one per five lift aircraft.

4. Gunship Requirements

No single ship or larger missions could be run without gunship escort due to the extremely hostile environment encountered during the operation. This being the case, the escort gunships were available to cover the downed crews. At times it became necessary to provide additional armed helicopter assets when the intensity of enemy fire, refueling requirements, or damaged escort gunships warranted. In such cases AH-1G's which were on standby fulfilling a general support role were dispatched. Sometimes these guns would already be committed and guns from lower priority missions had to be diverted. During the large scale operations, light fire teams would be designated specifically to the downed crew recovery role. They remained with the crew recovery team and were controlled by the AMC of the downed crew recovery effort. The number of light fire teams allotted varied according to the enemy situation and expected intensity of contact, varying from 1 LFT per five recovery aircraft to 3 LFT's per 10 recovery aircraft.

5. Air Cavalry

The 2d Squadron, 17th Cavalry, had an attached company of ARVN troops available specifically for downed crew recovery. These troops were on five minute standby at Khe Sanh to be launched as a

IV-99

CONFIDENTIAL

CONFIDENTIAL

217

security force for downed crews when all other attempts at rescue failed. 2/17 Cav provided all the aircraft necessary to support such insertions once they were given the mission. Upon receipt of a mission they were given an area of operations and the responsibility of extracting the crews utilizing means required. Additional assets from the Air Force and Army were made available to the 2/17 Cav as necessary.

6. CO, 101st Aviation Group Comments

Normal procedures followed in low intensity warfare were found to be inadequate in the environment encountered during LAMSON 719. Command and control of recovery efforts is so complicated that it requires experience on a par with that necessary for the command and control of the tactical mission. Formal planning and designation of assets for the specific mission of air crew recovery is required. There are basically three categories of missions encountered in mid-intensity warfare that require air recovery plans:

a. Low Risk Missions

(1) Gunship escort must be provided for all missions required to make approaches and landings.

(2) Aircraft not on specific missions of landing or egressing flight at levels lower than optimum should be employed in pairs. In areas of no security, search and rescue operations are prohibitive. The availability of an observer, if only to pinpoint a downed aircraft's location, is essential. In addition to this capability, the companion aircraft may be able to extract the downed crew.

b. High Risk Missions

On missions where enemy activity is pronounced and the intensity of hostile fire increases the possibility of downed aircraft, a rescue plan is required. In addition to the gunship escort provided for such missions, provisions must be made for downed crew recovery in the form of a chase aircraft. In this situation the chase ship's sole purpose is to monitor the progress and position of the aircraft

IV-100

CONFIDENTIAL

CONFIDENTIAL

218

executing the primary mission. Should an aircraft be downed the gun escort must immediately revert to the recovery effort. At this point the flight lead, or the commander of the chase ship, must take control of the operation. It is then the responsibility of the chase aircraft, supported by the fires of the escort guns, to recover the downed personnel.

c. Major Airmobile Operation

For a major airmobile operation a formal plan is required with an experienced AMC and assets, to include gunships, assigned to the recovery mission. The recovery plan must be thoroughly coordinated with the tactical air movement plan in order to provide good coverage of all portions of the operation. Areas should be designated as divert areas where crippled aircraft will be able to make a safe landing if further flight is not possible or advisable. Selection of divert areas should be based upon enemy situation, suitability of the landing site, and acceptability of the area for security forces. Attackers must be thoroughly briefed on the location of these divert areas and all recovery procedures. MEI VAC aircraft must be on station in case their hoist capability is required to extract a downed and injured crew. Crew recovery experience during LAMSON 719 is shown at Figure IV-22.

IV-101

CONFIDENTIAL

CONFIDENTIAL

Date	Extraction Operations		Extraction Crewmembers		Remarks
	Operations	Extracted	Not Completed	MIA	
8 Feb	6	24			
10 Feb	5	16			
12 Feb	1	2	1	2	Acft exploded in air and again on ground impact
13 Feb	1	4			
14 Feb	1	4			
15 Feb			1	6 *	Acft exploded in air and again on ground impact
18 Feb	4	12	1	3	Acft exploded in air and again on ground impact
19 Feb	1	4			
20 Feb	2	8	1	4	Acft shot down, burned on ground impact
21 Feb	2	8			
23 Feb	4	15			
24 Feb	1	2		*	Changed to KIA

IV-102

CONFIDENTIAL

FIGURE IV-22 (C). Crew Extraction Experience During LAMSON 719 (U).

<u>Date</u>	<u>Extraction Operations</u>		<u>Extraction Crewmembers</u>		<u>Remarks</u>
	<u>Operations</u>	<u>Extracted</u>	<u>Not Completed</u>	<u>MIA</u>	
26 Feb	2	4			
27 Feb	1	5	1	2	Acft shot down, hit ground with severe impact, Crew thrown out with seats, visual recon confirmed no movement. Rescue driven off by hostile fire
28 Feb	1	4			
3 Mar	10	40	1	1 *	3 walked in. Acft decoyed into wrong LZ by NVA smoke grenade and shot down by RPG and small arms fire. Acft burned, three of the crew walked to an ARVN firebase
4 Mar	5	13			
5 Mar	10	37	1	4	Exact location of Acft unknown, last reported vic LOLO W of ALUOI out of control
6 Mar	2	8	1	2	Aircraft never located
8 Mar	1	4			
9 Mar	1	4		*	Changed to KIA

FIGURE IV-22 (C). Crew Extraction Experience During LAMSON 719 (U) (continued).

IV-103

CONFIDENTIAL

CONFIDENTIAL

220

CONFIDENTIAL

<u>Date</u>	<u>Extraction Operations</u>	<u>Extraction</u>		<u>Crewmembers</u>	<u>Remarks</u>
		<u>Extraction Operations</u>	<u>Crewmembers</u>		
10 Mar	3	10			
11 Mar	4	15			
14 Mar	1	4			
15 Mar	1	2			
16 Mar	1	4			
18 Mar	4	15	1	2	Pilot reported loss of hydraulics, acft exploded on impact with ground.
19 Mar	3	12	1	3	Rescue attempts driven off by hostile fire, 1 man walked in
20 Mar	11	44	1	4	Acft exploded in air twice, burned on ground impact
21 Mar	3	10			
22 Mar			1	4	Acft Exploded in air
24 Mar	2	8			
TOTALS	94	347	9	30	

FIGURE IV-22 (C). Crew Extraction Experience During LAMSON 719 (U) (continued).

IV-104

CONFIDENTIAL

L. (U) AIRCRAFT RECOVERY1. General

Initially, the Downed Aircraft Recovery Plan of the 101st Avn Div (AMBL) was distributed to all units attached and assigned for LAMSON 719. A copy of this plan is included as Annex B. This plan proved to be quite effective with minor modifications and was used throughout the operation. Basically, each major unit involved in operations supporting LAMSON 719 provided an aircraft recovery ship and crew on a daily basis. These maintenance recovery aircraft reported to the maintenance recovery officer and were under his direct control. This officer was the overall coordinator and responsible individual for the physical recovery of any aircraft downed in the operation, for any reason, at any location. Each maintenance recovery crew consisted of an aircraft maintenance officer, a technical inspector, and trained aircraft riggers. Medium and heavy lift assets were on call to extract aircraft expeditiously once they had been rigged. In addition to the recovery aircraft the maintenance recovery officer also had access to gunships on a mission basis.

2. Notification

The notification channels for downed aircraft followed normal reporting channels. The first unit aware of a downed aircraft reported the following information, through higher headquarters, to the S-3, 101st Avn Gp.

- a. Type of aircraft
- b. Location
- c. Area secure or non-secure
- d. Owning unit
- e. Condition of aircraft, passengers and crew

3. Decision to Recover an Aircraft

a. The most important factor considered in deciding whether or not an attempt to extract a downed aircraft should be made was the tactical situation. No set formula could be established; instead each recovery effort had to be considered in light of its own possibilities

of success. Where hostile fire and enemy contact were in the proximity of the downed aircraft, the extraction was delayed until a more opportune time, based on the ground commander's recommendations. If extraction appeared feasible, a maintenance recovery aircraft and gun escort were launched immediately. The recovery crew was deposited at the downed aircraft site while the recovery aircraft departed and orbited at altitude to deprive the enemy of a more lucrative target. The recovery crew evaluated the downed ship with regard to first, whether it was flyable or non-flyable; second, if it was not flyable, whether it could be rigged and extracted; third, whether or not the aircraft was worth recovering. In cases where the tactical situation or extent of battle damage to the aircraft precluded extraction, the crew recommended destruction in place. If the downed aircraft was recoverable, the crew radioed their orbiting aircraft and requested medium lift aircraft to be sent out while they rigged the downed aircraft.

b. Timeliness of aircraft recovery became a critical factor as it was in downed crew recovery. On several occasions when the maintenance evaluation and recovery were delayed, the enemy had time to set up around the downed aircraft site, booby trap it, register indirect or direct fires on it, and in effect use it as bait for an ambush. Five recovery aircraft were damaged or destroyed when they attempted to retrieve downed ships. The North Vietnamese would often remain clear of a downed aircraft and crew waiting to bring accurate and devastating fire on all recovery attempts. This development generated the requirement for a chase ship to follow all maintenance recovery aircraft when they went on missions.

4. Gunship Requirements

Gunship escort was required and used for all recovery efforts from nonsecure areas. The mission of the gunships was to escort the maintenance aircraft into and out of the recovery area. The gun team remained on station over the recovery site to give fire support to the recovery team when required. When the downed aircraft was rigged, gunships escorted the medium/heavy lift aircraft during the extraction and finally escorted the maintenance aircraft during the pickup of the recovery team. Normally only one light fire team was required since the elapsed time of the entire recovery operation was rarely in excess of the fuel range of the gunships.

5. Rigging

Rigging was accomplished by the aircraft recovery teams. Members of these teams were trained to properly rig aircraft. They carried on the recovery aircraft sufficient rigging equipment for one of each type aircraft involved in the operation. Additional rigging equipment was immediately available for use on multiple extractions of the same type aircraft. Riggers supplied by the Division Support Command were used to rig aircraft for units not having an organic capability, e.g., ARA, Air Cav and MEDEVAC units. During the operation it was noted that an experienced rigging crew could completely rig an aircraft in five to ten minutes.

6. Disposition

Whenever possible, downed ships were taken directly to their ultimate destinations by the recovering aircraft. However, in many cases, because of the massive requirement for medium/heavy lift support, the recovered aircraft were taken from the field and dropped off either at Khe Sanh or some intermediate secure area. As assets became available, the maintenance recovery officer dispatched recovery aircraft to pick up the downed aircraft from these intermediate locations. He then had them transported to their ultimate destinations as designated by the owning unit. Every effort was made to advise the facilities at the destination that a sling loaded aircraft was enroute to their location.

7. CO, 101st Aviation Group Comments

a. As in crew recovery, it was discovered that timeliness of aircraft recovery is essential. Where the rigging and extraction were delayed for some reason, the enemy was able to place himself in advantageous positions hindering or precluding feasible recovery operations. The North Vietnamese often used downed aircraft as bait with which to draw more equipment and personnel into an ambush. In some cases the downed aircraft had to be destroyed because the tactical situation precluded recovery. A total of ten aircraft were not recovered because of the tactical situation. Recovery attempts of these ten aircraft resulted in the loss of three additional

CONFIDENTIAL

227

helicopters and several personnel WIA. The evaluation of an attempt must establish whether or not the risk is acceptable. In some instances the ground tactical plan called for immediate movement from the landing zone, hence any aircraft forced down there during the combat assault was not secure after departure of the ground troops. Two aircraft were shot down during recovery attempts in areas where ARVN were on the ground around the aircraft. Aircraft recovery efforts were among the most hazardous missions flown in LAMSON 719 when considered by sortie count and aircraft lost and personnel WIA.

b. Several problems arose because of the nonstandard nature of rigging equipment and lack of uniform rigging techniques. A simple and standard rigging kit must be developed to enable properly trained riggers to prepare a downed aircraft efficiently and quickly in a hostile environment. The possibility of including rigging gear for each particular aircraft as on-aircraft-required gear should be considered. Inspection teams at a central forward location could evaluate each aircraft and determine more accurately whether an aircraft needs direct, general or depot maintenance service and direct the aircraft accordingly. The magnitude of the recovery effort required is illustrated by the recovery of 51 aircraft from inside Laos and 214 from the staging area at Khe Sanh during Operation LAMSON 719. Recovery experience by type aircraft and date is shown in Figure IV-23.

DATE	LAOS				KHE SANH AREA			
	UH-1H	UH-1C	AH-1G	OH-6A	UH-1H	UH-1C	AH-1G	OH-6A
8 Feb	1				1		2	
9 Feb								
10 Feb	2						1	
11 Feb		1					2	
12 Feb				1				
13 Feb		1			2			
14 Feb					1			
15 Feb			1	1	1			
16 Feb					1			
17 Feb					1		1	
18 Feb	2		1		1	2	1	
19 Feb			1		1		1	1

FIGURE IV-23 (C). Aircraft Extracted During LAMSON 719 (U).

IV-108

CONFIDENTIAL

CONFIDENTIAL

228

DATE	LAOS				KHE SANH AREA			
	UH-1H	UH-1C	AH-1G	OH-6A	UH-1H	UH-1C	AH-1G	OH-6A
20 Feb	2		1		1		2	
21 Feb	1				2		6	1
22 Feb							3	
23 Feb			1		2		1	
24 Feb	1				1	1	3	1
25 Feb	1						4	
26 Feb					6		4	
27 Feb	2				3	1		
28 Feb	1			1	5		3	
1 Mar					3		2	
2 Mar	1				1		2	
3 Mar	2	2			4		2	
4 Mar	3				3		3	
5 Mar	2				8		1	
6 Mar	1				2		5	
7 Mar	1		1		4	2	3	
8 Mar					1		2	
9 Mar								
10 Mar							1	
11 Mar								
12 Mar	1				3		3	1 (OH-58)
13 Mar	1							
14 Mar	1				1			
15 Mar		1			2		2	
16 Mar	1				4		2	
17 Mar					2		1	
18 Mar	1	1	1		5	1		
19 Mar	2				4		1	
20 Mar	5				22		1	
21 Mar					8	1	3	
22 Mar					2		1	
23 Mar					1	1	5	
24 Mar					4	1		
TOTAL	35	6	7	3	113	10	84	6 (1 OH-58)

FIGURE IV-23 (C). (Continued) Aircraft Extracted During LAMSON 719 (U).

IV-109

CONFIDENTIAL

M. (U) AIRCRAFT MAINTENANCE1. Introduction

The magnitude of the aircraft maintenance and aircraft repair parts supply effort in support of LAMSON 719 is readily apparent from the aircraft density supported. All of the assets of the 101st Abn Div (Ambl) plus those from designated units of the 1st Avn Bde and 23d Inf Div were used. In addition to the organic division aircraft there were three air cavalry troops, an aerial weapons company, four assault helicopter companies, and one medium assault helicopter company. Total aircraft density both in and out of country was 127 OH-6A; 60 UH-1C; 379 UH-1H; 5 OH-58; 147 AG-1G; 80 CH-47; and 10 CH-54 aircraft. Backup direct support maintenance required to assist unit organic direct support maintenance elements was provided by the 101st Abn Div (Ambl) aircraft maintenance battalion augmented with a direct support company and additional civilian and military personnel. Aircraft maintenance facilities were in operation throughout the area of operations. (Figure IV-24). Divisional aircraft maintenance units continued operation at assigned stations while the attached direct support company set up operations at a more forward location. The magnitude of the total effort is depicted at Figure IV-25, which portrays the spectrum of the aircraft processed.

2. Planninga. Organization

It was planned that the 335th Direct Support Company (-) of the 23d Inf Div would be attached to the 101st Abn Div (Ambl). It was felt that this addition would provide a capability adequate to support the operation. The units of the 5th Transportation Battalion (AM&G) were scheduled to remain at pre-operation locations at Camp Eagle and Phu Bai. The 335th, augmented as necessary would operate at Quang Tri for about 90 days. Mission alignment

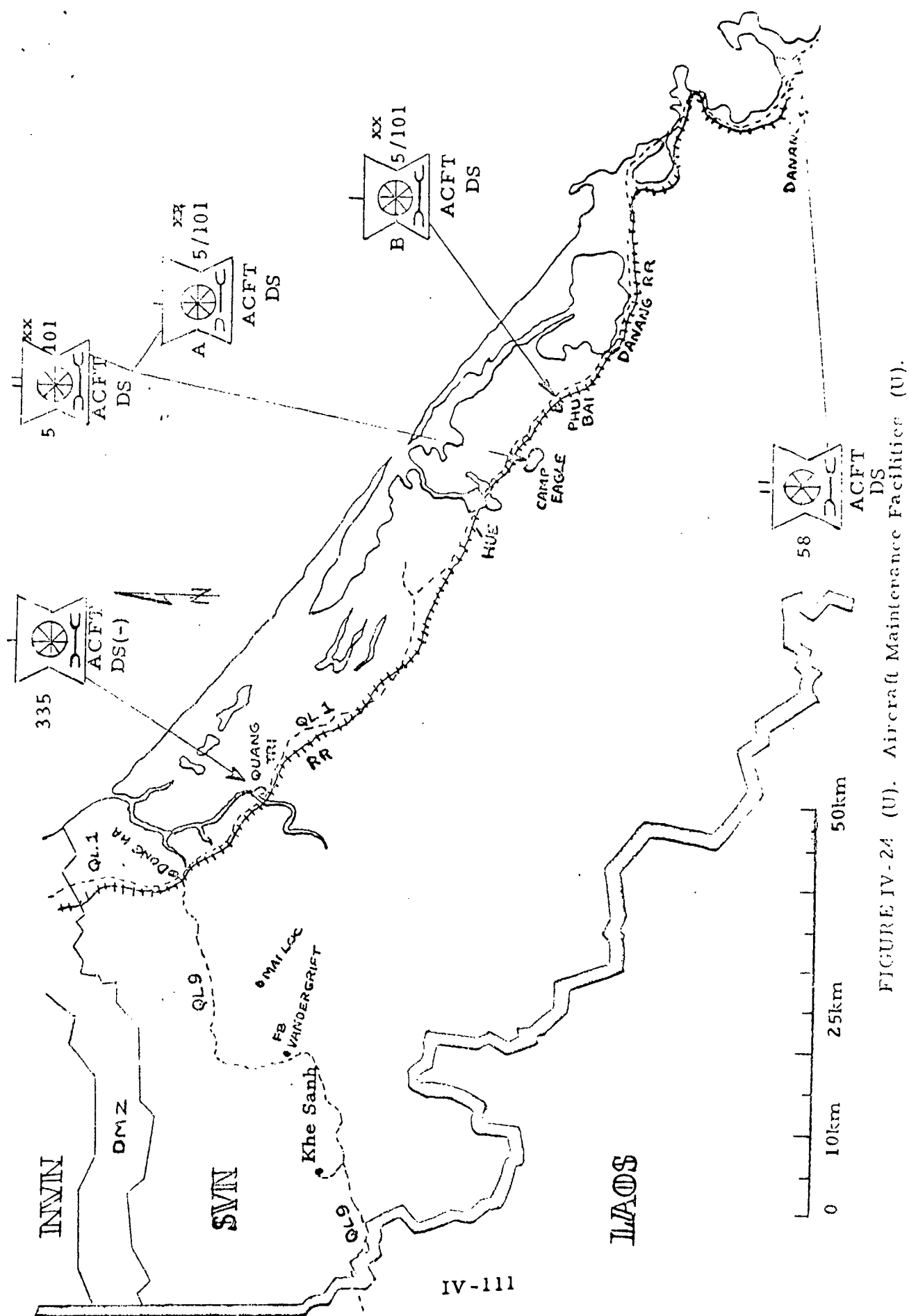


FIGURE IV-24 (U). Aircraft Maintenance Facilities (U).

	<u>A Co</u>	<u>B Co</u>	<u>335th</u>	<u>Total</u>
Work Orders (Includes complete aircraft only)	352	491	209	1133
Repaired and returned to units	350	472	250	1072
Turned in/Evacuated*	86	88	78	252

*Includes aircraft beyond repair as determined by quality control teams. Work orders were not prepared on obviously salvage aircraft.

FIGURE IV-25 (U) Aircraft Maintenance Activities (U).

3. Organization for Support

a. The 5th Transportation Battalion is organized under MTOE based on TOE's 55-405T, and 55-407T, with the mission for providing direct support and backup direct support maintenance and supply to organic division aircraft. The battalion has a battalion headquarters, a headquarters company, and two identical lettered companies. Each letter company normally supports about 210 aircraft.

b. The 335th Direct Support Company (-) of the 23d Inf Div with about 113 officers and enlisted personnel was attached.

c. An aircraft supply assistance team, as on site advisors, provided technical knowledge and assistance.

d. Members of the Aircraft Classification Control Point in Saigon were attached to provide retrograde expertise in technical inspection, documentation, and movement of retrograde material generated by the operation.

4. Maintenance Management

a. General

5th Transportation was faced with the task of expanding from two direct support companies to three. The aircraft density to be supported virtually doubled in the first few days of the operation. At the same time the work load was increasing, the 335th was moving into place. To assist the 335th in establishing its maintenance and supply operations, the battalion formed a 26 man maintenance and supply advance party and located it at Quang Tri. Key personnel with a broad spectrum of skills to cope with any and all maintenance and supply requests were placed on the team.

structure for DS maintenance is shown at Figure IV-26. Backup direct support and general support was to be provided by the 58th Transportation Battalion at Da Nang.

b. Maintenance Management

The concept for maintenance support was maintenance effort which could be accomplished in one day and would be performed by the operational aviation unit direct support element. Work requiring three to five days would be performed at the direct support companies, and work estimated to require in excess of ten days would be retrograded to the 58th Maintenance Battalion at Da Nang. This would permit rapid replacement of long term maintenance losses while maintaining a high ratio of authorized to assigned and operational assets. To further expedite retrograde and disposition of unserviceable assets, maintenance shop loads were controlled by the 5th Transportation Battalion.

c. Supply

It was planned that both A and B companies of the 5th Transportation Battalion would operate direct support supply activities in support of the divisional aircraft. Since B company was located on the Phu Bai Airfield near Aerial Port facilities, it would be tasked to provide the aircraft parts support for the 335th Direct Support Company. The 335th Direct Support Company would deploy from the 23d Inf Div minus its aviation technical supply and NGR 500 processing and accounting system. It was further planned that the supply point at Quang Tri would perform as a major customer of B Company, 5th Transportation Battalion. Partial stockage for the Quang Tri supply point was to be provided by a push package supplied by the 34th General Support Group. The push package consisted of repair parts needed to support CH-47B or UH-1C aircraft for 90 days since B Company did not normally support that type aircraft. The push package was to be air transported to Quang Tri and broken down at the forward supply point.

<u>A Co 5th Trans En</u>		<u>E Co 5th Trans En</u>		<u>335th Trans Co</u>	
<u>Organic 101st Units</u>		<u>Organic 101st Units</u>		<u>Organic 101st Units</u>	
HQ 101 Bn		C 101 Bn		None	
A 101 Bn		D 101 Bn			
B 101 Bn		HQ 158 Bn			
C 101 Bn		A 158 Bn			
163 GS Co		B 158 Bn			
A 377 Arty		C 158 Bn			
HQ 4/77 ARA		D 158 Bn			
B 4/77 ARA		HQ 159 Bn			
C 4/77 ARA		A 159 Bn			
HQ 2/17th Cav		B 159 Bn			
B 2/17th Cav		A 4/77 ARA			
1st Ede		B 2/17 Cav			
3d Ede		C 2/17 Cav			
326 Med Bn		2d Ede			
<u>Others</u>		<u>Others</u>		<u>Others</u>	
179th ASHC (CH-47)		132 ASHC (CH-47)		HQ 14th Trans En	
		235 AHC (AH-1G)		71st AHC	
		227 AHC (AH-1G)		174th AHC	
		571 Med		HQ 223d Bn	
				238th AHC	
				48th AHC	
				173d AHC	
				C 7/17 Cav	
				B 7/1 Cav	
				F 8th Cav	

FIGURE IV-26 (U) Mission alignment Structure of 5th Transportation Battalion (U)

b. Control and Coordination

Maintenance operations for the 5th Transportation Battalion was controlled by the battalion S-3 (maintenance operations). Control was effected using data from status reports received from subordinate units. Workloads were then distributed and managed by the S-3 section. The S-3 was also responsible for coordinating with the 58th Transportation Battalion for general support and back-up direct support maintenance.

c. Maintenance Concept

(1) Quick Repair Service (QRS)

Locations were established where aircraft could obtain immediate repair and/or inspections. Qualified maintenance teams were available to evaluate damage or discrepancies and effect repairs. Only those discrepancies which placed the aircraft in a non-mission ready status were handled. Serial number components that were changed without benefit of historical records were recorded on the DA Form 2408-16. Procedures were established with customer units to follow up these actions and obtain all historical forms belonging to the component which was removed.

(2) Aircraft Work Ordered Through Normal Channels

Work performed on these aircraft was directed toward returning safe aircraft to service as soon as possible. Time did not permit 100 per cent technical inspections of all aircraft or the accomplishment of all deferred maintenance.

(3) Reports

Status reports of all aircraft work ordered to the direct support unit were provided to the S-3 by 2200 hours daily. In addition, information on aircraft released since 2400 hours the previous day and aircraft work ordered to general support maintenance was provided.

(4) Aircraft Turn-in

Units turned in aircraft through their respective direct support unit. The direct support unit inspected aircraft for cleanliness (removal of ammunition and foreign matter) made a complete inventory of all equipment and a serial number check of the aircraft. Once the aircraft and all equipment were complete, the 5th Transportation Battalion S-3 would be contacted for riggers and a lift aircraft.

(5) Nonoperational Ready Supply (NORS) Management

All valid NORS and possible NORS items were intensively managed and received special handling for expeditious delivery to the using unit. The number of items that could be handled in such a manner was limited. Therefore, all units were required to carefully scrutinize all NORS and possible NORS to insure they were absolutely valid.

5. Supply Procedures

a. General

The 5th Transportation Battalion continued its normal repair parts supply function with the added mission of supplying the 335th at Quang Tri. The 335th provided aircraft repair parts support to the new units in the Quang Tri area. The supply point was fully set up and functioning within the first few days of the operation.

b. Push Package

Partial stockage for the supply point was to be provided by a push package supplied by 34th General Support Group. The push package consisted of repair parts needed to support CH-47B or UH-1C Aircraft for 90 days. AT87NZ did not support any CH-47B or UH-1C aircraft prior to LAMSON 719. The concept was that the push package would be air transported to Quang Tri and broken down at the forward supply point. The first major problem occurred when it was decided

to station the CH-47B aircraft at Phu Bai and the UH-1C aircraft in the Quang Tri area. The push package then had to be flown into Phu Bai and broken down at AT87NZ for stockage of CH-47B parts and shipment to Quang Tri of UH-1C parts. A deck of receipt cards was provided prior to receiving the push package.

c. Authorized Stockage List (ASL) and Documentation

To provide the forward supply point at Quang Tri with a complete stockage of Authorized Stockage List (ASL) items for the UH-1H, OH-6A and AH-1G an ASL "cut" was devised based on a demand history of six within the prior 180 days. For those lines meeting this criterion, 25 per cent of the on hand stock was pulled and shipped to the forward supply point. A total of 700 lines were constituted using this criterion. Units in the Quang Tri area placed demands on the forward supply point at Quang Tri. Requisitions not filled at Quang Tri were passed to Phu Bai for fill. Items zero balanced at Phu Bai were subjected to lateral search actions within the division and simultaneously passed to the Aviation Material Management Center (AMMC) at Saigon for fill. Upon receipt at B Co of items previously requested from AMMC, records were checked to determine if lateral search action had previously satisfied the demand. Items on open requisition were passed to the customer through the supply point at Quang Tri. Control of Aircraft Intensively Managed Items (AIMI) was accomplished through application of standard control measures. A NORS rate of four per cent was experienced using this system (Figures IV-27, IV-28 and IV-29). The ASL of B Co contained about 3700 lines at the beginning of LAMSON 719 on 25 January 1971. On 26 January, 614 OFP 02 requisitions previously submitted were resubmitted to AMMC to fill existing zero balances. Of 614 requisitions submitted, 328 were filled. Shipping 25 per cent of the on hand lines accelerated the creation of additional zero balances by further reducing stock on hand. On 19 February 1971, an additional 563 OFP 02 requisitions were submitted to replenish zero balance lines; 398 were ultimately received. The quick buildup of units created additional problems in handling and managing large volumes of requests in all priorities and categories. The large increase in all types of documents received

February 1971

<u>Aircraft</u>	<u>Auth</u>	<u>ASGD</u>	<u>% OR</u>	<u>% MORS</u>	<u>% MORMM</u>	<u>% MORMM</u>	<u>Hours</u>	<u>Total Hours</u>
OH-6A	93	89	91.2	1.7	5.7	1.4	57.6	5,230
UH-1H	198	193	87.2	1.3	6.7	4.8	79.6	15,307
AH-1G	87	81	80.0	3.6	11.5	4.9	59.7	4,007
CH-47	48	49	78.9	1.9	10.6	8.6	61.4	3,011
CH-54	<u>0</u>	<u>10</u>	<u>82.4</u>	<u>1.9</u>	<u>15.7</u>	<u>0</u>	<u>39.1</u>	<u>111</u>
TOTALS	426	422	85.8	1.8	8.0	4.4	68.3	28,836

March 1971

<u>Aircraft</u>	<u>Auth</u>	<u>ASGD</u>	<u>% OR</u>	<u>% MORS</u>	<u>% MORMM</u>	<u>% MORMM</u>	<u>Hours</u>	<u>Total Hours</u>
OH-6A	93	92	84.2	5.2	9.0	1.6	63.0	6,000
UH-1H	198	159	83.1	1.1	9.0	6.8	87.0	16,440
AH-1G	87	81	72.0	2.7	19.5	5.8	62.1	5,031
CH-47	48	46	75.7	5.9	10.9	7.5	65.1	2,941
CH-54	<u>0</u>	<u>10</u>	<u>84.9</u>	<u>8.8</u>	<u>6.3</u>	<u>0</u>	<u>51.7</u>	<u>511</u>
TOTALS	426	418	80.4	3.1	11.2	5.3	74.3	32,083

FIGURE IV-27 (U) Aircraft Readiness and Flying Hours by
Type Aircraft Feb-Mar 71 (U)

February 1971

Unit	Type A/C	Auth	O/H	\$ OR	%ORS	%ORFM	%OROM	Avg Hrs Per A/C
101st Avn Gp								
101st Avn Bn								
HHC/101 OH-6A		3	2	84.8	2.6	12.6	0	33.3
A/101	UH-1H	20	20	82.0	2.0	7.7	8.3	78.2
B/101	UH-1H	20	20	89.6	1.4	2.7	6.3	87.9
C/101	UH-1H	20	19	79.5	1.3	18.7	.5	100.8
D/101	AH-1G	12	8	81.9	8.5	9.2	.4	53.6
158 Avn Bn								
HHC/158 OH-6A		3	2	71.9	0	26.0	2.1	61.5
A/158	UH-1H	20	19	85.6	3.1	7.7	3.6	80.9
B/158	UH-1H	20	20	91.4	.5	3.6	4.5	83.2
C/158	UH-1H	20	18	83.1	.2	6.2	10.5	80.6
D/158	AH-1G	12	11	73.3	2.7	7.1	16.9	73.3
159 Avn Bn								
HHC/159 OH-6A		3	3	91.0	5.6	1.3	2.1	52.3
A/159	CH-47	16	16	74.6	2.9	13.4	9.1	54.2
B/159	CH-47	16	16	80.0	1.9	8.4	9.7	62.2
C/159	CH-47	16	17	80.8	.9	8.9	9.4	61.8
163 Avn Co	UH-1H	10	10	95.6	.4	1.4	2.6	93.5
	OH-6A	10	12	89.9	1.9	8.2	0	83.3
TOTALS		221	213	83.8	2.0	7.9	6.3	76.7
2/17 Cav								
HHT	UH-1H	7	7	89.2	1.0	4.2	5.6	66.9
A/2/17	UH-1H	8	8	85.8	2.2	9.1	2.9	66.0
	AH-1G	9	8	84.1	1.4	14.1	.4	59.0
	OH-6A	10	11	94.6	.3	4.8	.3	33.5
B/2/17	UH-1H	8	8	90.3	0	6.3	2.4	56.1
	AH-1G	9	9	89.2	0	10.0	.8	46.7
	OH-6A	10	10	85.3	1.9	12.7	.1	46.4
C/2/17	UH-1H	8	8	87.6	0	10.6	1.8	55.4
	AH-1G	9	9	86.3	0	11.3	2.4	55.6
	OH-6A	10	8	91.6	0	7.1	1.3	23.8
TOTALS		88	87	88.6	.7	9.1	1.6	49.8

Figure IV-28 (U) Aircraft Readiness and Flying Hours by Unit (U)

February 1971

Unit	Type A/C	Auth	O/H	% OR	%NOPS	%NORM	%NOROM	Avg Hrs Per A/C
DIVARTY								
HREB/4/77	UH-1H	3	3	85.8	2.1	3.3	8.8	87.7
A/4/77	AH-1G	12	12	78.3	9.2	6.4	6.1	52.8
B/4/77	AH-1G	12	12	74.8	2.5	22.3	.4	66.5
C/4/77	AH-1G	12	12	76.9	3.3	18.1	.9	54.3
A/377	UH-1H	4	4	87.5	4.1	0	8.4	58.3
	OH-6A	18	16	89.7	5.5	1.6	3.2	43.1
TOTALS		61	58	81.5	5.1	9.9	3.5	63.3
1st Bde	UH-1H	5	5	87.9	0	5.7	6.4	99.0
	OH-6A	8	8	95.1	0	3.1	1.8	82.9
TOTALS		13	13	92.3	0	4.1	3.6	89.1
2d Bde	UH-1H	5	5	94.3	0	2.5	3.2	90.8
	OH-6A	8	8	96.4	0	2.7	.9	71.9
TOTALS		13	13	95.6	0	2.6	1.8	79.1
3 Bde	UH-1H	5	5	91.4	0	4.3	4.3	74.2
	OH-6A	8	8	94.7	0	2.6	2.7	75.4
TOTALS		13	13	93.5	0	3.2	3.3	74.9
326 Med	UH-1H	12	11	88.6	.6	6.3	4.5	51.2
5th Trans								
HHC/5th TC	UH-1H	1	1	88.0	0	12.0	0	77.0
A/5th TC	UH-1H	1	1	100.0	0	0	0	69.0
	OH-6A	1	--	--	--	--	--	--
B/5th TC	UH-1H	1	1	100.0	0	0	0	68.0
	OH-6A	1	1	100.0	0	0	0	57.0
TOTALS		5	4	97.1	0	2.9	0	67.0
478th Avn	CH-54	0	10	82.4	1.9	15.7	0	39.1

FIGURE IV-28 (U). Aircraft Readiness and Flying Hours by Unit (U).
(continued)

241

March 1971

Unit	Type A/C	Auth	O/H	% OR	% FORS	% HOPEN	% HOPOM	Avg Hrs Per 1/0
101 Avn Gp								
101 Avn Bn								
HHC/101	OH-6A	3	2	89.5	0	10.5	0	65.5
A/101	UH-1H	20	20	75.4	2.1	15.7	6.8	84.3
B/101	UH-1H	20	18	85.3	0	4.8	9.9	84.0
C/101	UH-1H	20	18	80.0	0.4	7.2	12.4	101.6
D/101	AH-1G	12	11	75.0	3.2	8.2	13.6	61.8
158 Avn Bn								
HHC/158	OH-6A	3	2	46.4	0	53.6	0	10.0
A/158	UH-1H	20	17	85.4	0.8	9.3	4.5	90.2
B/158	UH-1H	20	19	89.5	0.2	4.6	5.7	97.5
C/158	UH-1H	20	18	81.7	4.6	6.8	6.9	94.4
D/158	AH-1G	12	12	69.2	2.1	12.3	16.7	78.6
159 Avn Bn								
HHC/159	OH-6A	3	3	72.8	9.3	13.3	4.6	67.0
A/159	CH-47	16	16	76.7	2.5	15.1	5.7	64.3
B/159	CH-47	16	16	72.1	5.9	10.8	11.2	63.6
C/159	CH-47	16	14	78.5	10.1	6.2	5.2	64.4
163 Avn Co								
UH-1H	10	14	86.4	0.9	9.7	3.0	57.1	
OH-6A	12	11	79.8	7.6	12.6	0	109.6	
TOTALS		223	221	79.7	3.2	9.8	7.3	62.2
2/17 Cav								
HHT	UH-1H	7	7	87.4	0	8.4	4.2	77.8
A/2/17	UH-1H	8	7	87.5	0	8.8	3.7	64.7
	AH-1G	9	8	79.5	0	14.9	5.6	70.8
	OH-6A	10	10	86.1	8.1	5.8	0	23.4
B/2/17	UH-1H	8	8	84.2	2.8	12.2	0.8	55.4
	AH-1G	9	9	74.4	1.4	23.7	0.5	44.2
	OH-6A	10	10	84.3	4.9	10.1	0.7	35.9
C/2/17	UH-1H	8	7	69.2	0	29.0	1.8	60.1
	AH-1G	9	9	68.4	3.6	25.8	2.2	68.2
	OH-6A	10	9	82.5	8.2	0.9	0.4	39.7
TOTALS		88	84	80.7	3.2	14.5	1.6	54.6

FIGURE IV-29 (U) Aircraft Readiness and Flying Hours by Unit (U)

IV-122

March 1971

242

Unit	Time A/C	Avch	O/N	% OR	%	%	%	Avch
DIVARTY								
HESE/L/77	UH-1H	3	3	90.0	0	7.6	2.4	78.3
L/4/77	AH-1G	12	9	91.9	1.8	2.4	4.9	97.9
B/4/77	AH-1G	12	12	76.8	6.3	25.6	0.3	45.2
C/4/77	AH-1G	12	11	60.3	2.1	35.6	1.0	65.0
A/377	UH-1H	4	4	84.9	4.1	0	11.0	87.0
	OH-6A	12	19	82.4	7.0	8.6	2.0	87.2
TOTALS		61	53	76.5	4.4	16.5	2.6	63.7
1st Bde	UH-1H	5	5	89.7	0	4.5	5.8	117.6
	OH-6A	8	8	91.6	3.2	2.4	2.8	88.3
TOTALS		13	13	90.8	2.0	3.2	4.0	99.5
2d Bde	UH-1H	5	5	89.7	0	9.0	1.3	89.2
	OH-6A	8	8	97.3	0.9	1.8	0.9	88.8
TOTALS		13	13	93.9	0.5	4.6	1.0	81.7
3d Bde	UH-1H	5	5	81.4	0	5.5	13.1	91.8
	OH-6A	8	8	84.6	0	8.9	6.5	98.6
TOTALS		13	13	83.4	0	7.6	9.0	97.2
325th Med	UH-1H	12	11	74.9	1.0	10.4	13.7	63.7
5th Trans								
HHC/5th TC	UH-1H	1	1	94.1	0	5.9	0	48.0
A/5th TC	UH-1H	1	1	95.5	0	3.2	1.3	95.0
	OH-6A	1	1	76.9	0	23.1	0	13.0
B/5th TC	UH-1H	1	1	83.5	0	6.5	0	62.0
	OH-6A	1	1	100.0	0	0	0	76.0
TOTALS		5	5	94.4	0	5.3	.3	59.5
478th Avn	CH-54	0	10	84.9	8.8	6.3	0	51.7

FIGURE IV-29 (U) (continued) Aircraft Readiness and Flying Hours by Unit (U)

required a change from a two to three day cycle to a daily supply cycle. Four document registers were established to process the requests received at Quang Tri: 02 OFP, and 12 OFP document registers. Initially only EDP and OFP 02 requests were searched for assets on hand at the forward supply point. Other lower priority requests were entered in the document register and passed directly to B Co. The purpose of the forward supply point was to initially provide support for deadlined equipment rather than the wholesale replenishment of unit PLL's. However, units supported by the forward supply point submitted EDP requests because they had deployed on short notice and either had not brought sufficient PLL supplies with them or had previously depleted their PLL's as part of a standdown for deactivation action. The initial reorder point for the forward supply point was 50 per cent of the original amount received from the push package. The original stockage level was the requisitioning objective (RO). The reorder point was later moved to 75 per cent of the original amount received, and 05's and 12's could then be processed and released to 50 per cent of the RO. This action insured a safety level and sufficient stockage on hand to cover any NORS requests.

d. Transportation/Movement of Repair Parts

Ground vehicle transportation assets within a transportation aircraft maintenance company operating under the airmobile concept are very limited. The majority of aircraft parts needed had to be moved by truck. All aircraft repair parts for the Quang Tri area passed through B Co and then were shipped to Quang Tri by truck. All unservicable parts were retrograded to Phu Bai by truck. The 335th Direct Support Company had three stake and platform tractors and trailers which were used extensively.

6. 5th Transportation Battalion Commander's Observations

a. General

The initial delay in designating the units to implement the operation slowed structuring of the maintenance and supply support

plan. The maintenance and supply support capability of the 5th Transportation Battalion was limited at the outset to the four types of aircraft organic to the 101st Abn Div (Ambt).

b. Organization

(1) Mission

The aviation maintenance battalion in an airmobile division should have an organic capability to move critical items of supply for aircraft support to include repair parts, components and subassemblies. This mission should be added to the battalion. The 5th Transportation Battalion processed large quantities of high dollar value aircraft repair parts even though there is no provision for this in the mission of the unit as authorized in the TOE. Provisions for this type of activity should be incorporated in subsequent TOE changes.

(2) TOE

The aviation maintenance company should be revised to provide the following capabilities:

(a) Increase of Direct Support Capability

With only one direct support platoon per aviation company the unit was forced to overcentralize its operation, with a delay in performance of maintenance and related functions. With three direct support platoons a direct support capability could be operated in three different locations. Considering the broad nature of the type of conflict and the high degree of mobility desired in airmobile operations, this would be highly advantageous. This structure would permit greater specialization of functions, e. g., use of two platoons for periodic inspections and the third for unscheduled maintenance requirements. This would improve the quality of maintenance performed and the speed with which it can be accomplished.

(b) Increase in Service and Equipment Capability

There are not enough personnel in the service and

equipment platoon to provide for onsite servicing of equipment. This situation represents only a minor inconvenience under normal conditions, but becomes a great obstacle in intensified operations such as LAMSON 719. The addition of one or more mobile service sections is required.

(c) Addition of a Recovery/Retrograde Section

The aviation maintenance companies under present TOE can only recover light aircraft such as the OH-6A and then only when riggers are provided from an outside source. In addition, when aircraft are being retrograded by air there is no organic capability for rigging these aircraft prior to sling loading to another area. Eight to ten trained riggers would be required at unit level to create this section, and would be used in conjunction with a battalion level flight platoon, consisting of three to five CH-47 helicopters. These aircraft could be utilized for both recovery and retrograde operations as necessary and eliminate the need to request aircraft within competitive operational priorities.

(d) Increase in Support Type Equipment

There is a definite and pronounced need for an increase in support equipment, such as compressors, generators, and fork lifts, especially in higher-intensity situations such as LAMSON 719. Aviation maintenance companies operated on a 24 hour basis, putting a strain on present resources making scheduled maintenance difficult.

c. Transportation of Aviation Repair Parts and Equipment

The shortage in general support trucking assets was a major problem in movement of critical aircraft parts and components. It was offset by use of five ton stake and platform assets acquired by attachment of the 335th Direct Support Maintenance Company. Problems of major proportions would have existed had these trucks not been available. Air movement within Military Region I was satisfactory

only after CH-47 aircraft were dedicated on a daily basis to moving high priority parts and retrograde aircraft. Additional organic trucks are required.

d. Supply Operations

(1) Urgency

High priority air shipments of aircraft repair parts were often delayed or in some cases cancelled completely. The same held true on highly critical major components that needed to be retrograded within a specific period of time after receipt. Movement of routine priorities was difficult to obtain and sometimes impossible. Lack of routine replenishment resulted in an increasing number of high priority requisitions which in turn caused an added burden on the already strained transportation system.

(2) Augmentation

The skill level of the civilian augmentation team was based on operations at depot level. A period of adjustment was required for the team to adjust to the DSSA methods of operation. The personnel provided were well suited for warehouse work and filled a void within the warehouse. No augmentation was provided for the NCR system at Phu Bai.

(3) NCR 500 Support

Problem areas identified were not in all cases reconciled as rapidly as desired. Support personnel were notified of a machine problem requiring parts and technical representative prior to the operation reaching its peak momentum. Midway through the operation the problem still existed. A microfilm reader was requested but not received. Without these tools to perform the mission, much time and effort were lost.

(4) Transportation

(a) Coordination

The services provided by the 15th Aerial Port at Phu Bai were limited. The activity had no transportation assets available and its service was restricted to coordinating shipments. It provided equipment to load and move repair parts from the Aerial Port. This added transportation requirement caused delays and set-backs in execution of the basic supply mission.

(b) Communications

Problems in communication were experienced in contacting either Saigon or Quang Tri. This was solved by installation of a high frequency radio network.

(5) Supply

(a) In future operations, an advance supply point capable of handling basic supply problems should be developed essentially as organized for LAMSON 719. This supply point should later be displaced as the basic DSSA becomes operational. The supply operation in such events would have its own capability to reconstitute a jump or forward supply point. With an activity code of the basic supply point parts could be shipped directly to their location. Time is important and cutting down delays in shipment is imperative. The advance supply activity would also laterally search other DSSA's or have a DSSA that supports them, prepare requisitions for their address code in the event of a zero balance. A series of document numbers could be set aside and status provided in the event the supporting DSSA initiates requests.

(b) Use of a push package, when carefully constructed, is quite helpful; however, it should be documented and annotated with end item applicability. Parts could then be identified and shipped to different locations in the event of aircraft dispersal.

(c) AIMI stockage levels should be changed prior to the commencement of operations to insure sufficient quantities on hand to support the aircraft densities required by the mission. If levels cannot be readily computed, push packages should be provided pending determination of adequate stockage levels.

(d) A system with some automated capability should be obtained and used to process requests. Requests processed through such a system would cut down time spent in manual processing and ordering. As stated earlier the supply activity with its own activity address code could use such a system and provide improved supply support for its customers.

(e) In planning for other operations of the same scope and magnitude, a dedicated aircraft for the purpose of moving aircraft repair parts is necessary. Major assemblies and high priority parts are essential in sustaining support of aviation assets; therefore priority access to air transport is essential.

(f) Every effort should be made to obtain required support equipment for the technical supply activity prior to the operation, e. g., NCR 500 support and microfilm reader support. The DSSA selected to support the operation should be given a series of technical inspections and assistance to include repair of all essential support equipment. An NCR 500 technical representative should be immediately available to assist with any technical difficulties that might arise with the machine functions.

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N. (C) PERSONNEL SUMMARY1. Flying Hours

In mid-February it became apparent that the 101st Airborne Division (Airmobile) aviation units and units OPCON to the 101st Aviation Group could not maintain the level of flight hours required to support LAMSON 719 and at the same time adhere to the USARV flight time regulation. This regulation requires both aviators and enlisted crew members to be grounded after flying 140 hours in a 30 day period. A request to waive this regulation was forwarded from the 101st Airborne Division (Airmobile) to USARV. A waiver of the regulation was granted to units directly supporting LAMSON 719 (USARV msg DTG 040939Z Mar 71). Although the mandatory grounding at the 140 hour level was waived, the flight surgeon continued to evaluate individuals and recommended grounding when fatigue was evident. Fatigue was present in individual aviators and crew members but was not a significant problem at any time during the operation. Although all air crews experienced increased fatigue during the operation, the only significant increase in flight time above the 140 hour level was among the key personnel, particularly at the section and platoon level.

2. Casualties

In 45 days of combat flying over Laos, a total of 152 casualties were incurred by US Army and USMC helicopter crews; of this total 152 were WIA, 26 KIA and 32 MIA. The average casualties per day were 3.4 WIA, .58 KIA and .71 MIA. During the entire operation a daily average of 161 aircraft and 575 air crew personnel were exposed to combat flight. An average of 4.7 crew members were injured or killed per day, which is eight tenths of one percent of the total personnel exposed each day. Further examination of casualty figures indicates that for each 1000 hours flown during the 45 days, slightly over five aviators or crew members became casualties. Sorties flown in Laos were recorded separately from the sorties flown in Vietnam. The casualty rate for the total sorties (both in Laos and Vietnam) flown during the operation was less than two casualties per 1000 sorties flown as compared to nearly five casualties for each 1000 sorties flown in Laos.

IV-100

CONFIDENTIAL

CONFIDENTIAL

255

	<u>KIA</u>	<u>WIA</u>	<u>MIA</u>
Combat flight	26	152*	32*
Other combat**	14	41	0
Total	40	193	32

* Includes 2 WIA and 2 MIA 1st Brigade, 5th Infantry Division (Mechanized) personnel that were aboard an OH-58 aircraft which was shot down in Laos.

** Other combat includes combat casualties which were incurred in support of LAMSON 719 but were not in Laos. These casualties were primarily as a result of indirect fire and sapper attacks against Khe Sanh combat base but also include nine US Marine personnel which were killed when a CH-53 aircraft crashed in South Vietnam. The aircraft was enroute to its home base after completing a combat mission over Laos where it is believed to have incurred combat damage.

FIGURE IV-30 (C) Recapitulation of Casualties (U).

IV-131

CONFIDENTIAL

257

O. (U) AVIATION SAFETY

1. Accidents

During LAMSON 719, eleven accidents occurred as a result of the operation. Aircraft under the control of the 101st Aviation Group flew a total of 37,992 hours in support of the operation as determined from Section 16 of the OPREP 5 report. This represents a rate of 29.0 accidents per 100,000 flying hours. Aircraft continually encountered intense hostile fire during combat assaults and logistic missions. The tactical situation also involved maximum loads, evasive maneuvers, and quick tactical decisions involving the evaluation of risk. When an aircraft went down, it was quickly surrounded by enemy making it difficult for the recovery crews to evacuate the crew members. As aircraft were recovered, they were examined and the circumstances investigated as the tactical situation permitted.

2. Comparison of Accident Rates

a. Yearly Comparison

To portray how LAMSON 719 influenced operational results in comparison with those of the year before, the statistics of the 101st Airborne Division (Airmobile) were selected. This was the largest integral unit in LAMSON 719 which had been operating as such for the period compared.

b. The division flew 7,548 hours more during the month of February and March 1971 than during the same time period in 1970. See Figure IV-31 below:

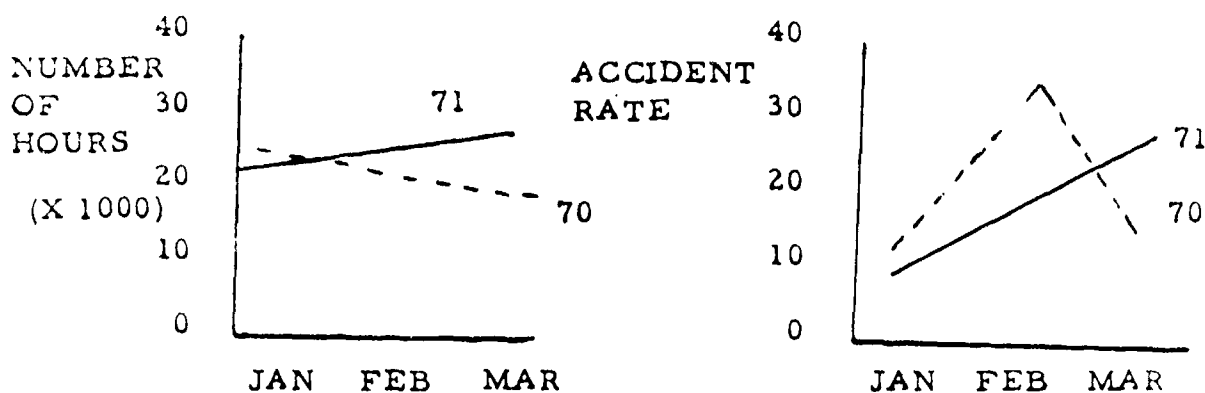


FIGURE IV-31 (U). 101st Abn Div (Ambl) Hours Flown and Accident Rate, 3rd Qtr FY 70 and 71 (U).

c. An examination of hours and rates in the 101st Aviation Group shows that the Group flew 8,188 hours more during the month of February and March 1971 than during the same period in 1970, experiencing an average rate reduction of 13.8 accidents per 100,000 flying hours. See Figure IV-32 below:

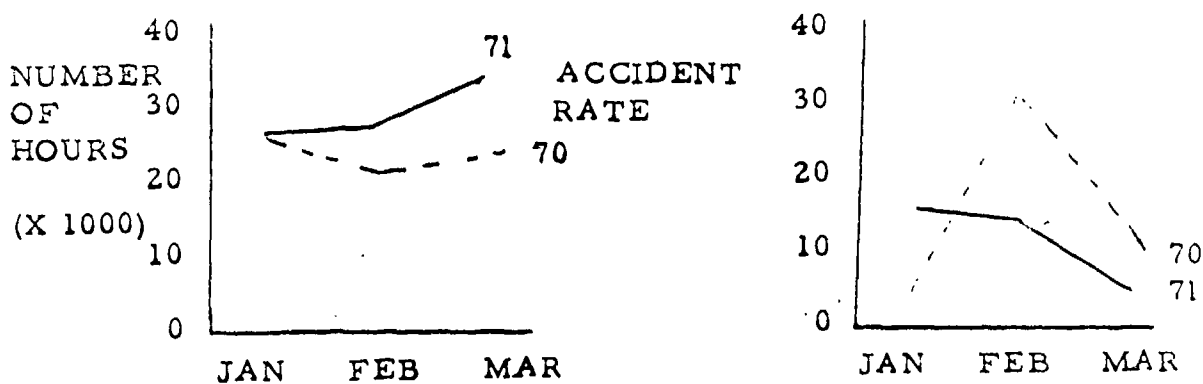


FIGURE IV-32 (U) 101st Avn Gp Hours Flown and Accident Rate, 3rd Qtr FY 70 and 71 (U).

d. The increase in flying hours is a result of the operational requirements of LAMSON 719 and also the requirement to support troops in the Division area of operations. When flying hours are increased, the rate will drop if the number of accidents remains relatively stable or decreases.

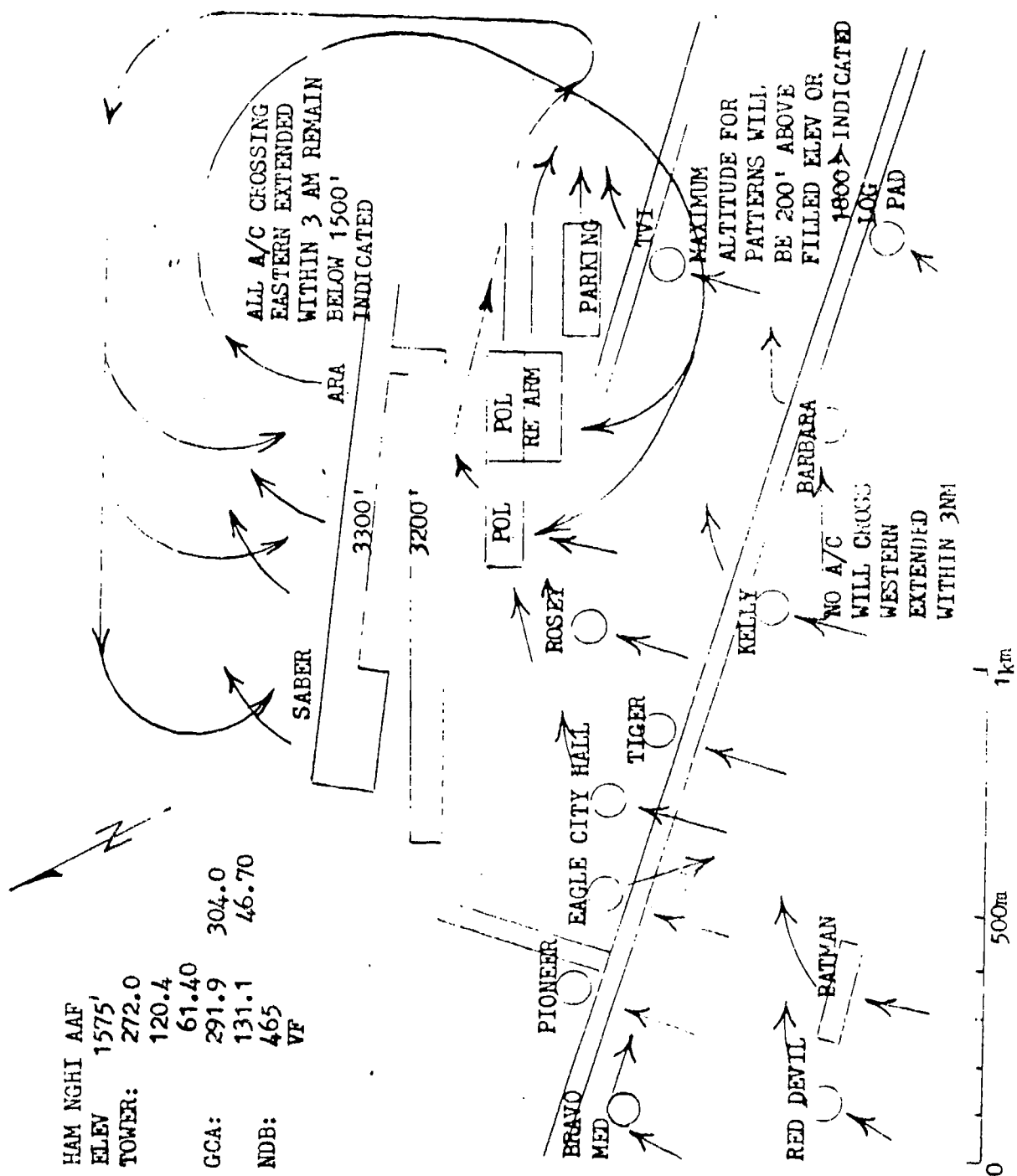


FIGURE IV-33 (U). Khe Sanh Air Facility and Flight Routes (U).

8 February - 24 March

<u>DATE</u>	<u>TYPE ACFT</u>	<u>LOCATION</u>	<u>UNIT</u>	<u>CIRCUMSTANCES</u>
<u>101st Airborne Division (Airmobile) Organic Aircraft</u>				
15 Feb	CH-47C	Phu Bai	A/159	While on testflight, aircraft crashed inverted
2 Mar	OH-6A	Quang Tri	C/2/17	Hovered between two parked aircraft
16 Mar	AH-1G	Quang Tri	B/4/77	Pilot tried to return south, went IFR and crashed
22 Mar	OH-6A	FB SARGE	A/377	Went IFR crossing ridgeline and crashed into trees
<u>223d Aviation Battalion</u>				
14 Feb	AH-1G	Khe Sanh rearm	C/7/17	Main rotor strike, hovered too close to another aircraft
18 Feb	UH-1C	Khe Sanh rearm	173d	Aircraft took off at maximum gross weight passing another aircraft which was pulling pitch
23 Feb	UH-1H	DELTA 1	173d	Midair collision
5 Mar	AH-1G	Between Vandergrift and Khe Sanh	B/7/1	Aircraft grazed hill while low level
6 Mar	AH-1G	Khe Sanh	B/7/1	Aircraft went IFR while on GCA, aircraft mission

FIGURE IV-34 (U). Aircraft Accidents, LAMSON 719 (U).

<u>DATE</u>	<u>TYPE ACFT</u>	<u>LOCATION</u>	<u>UNIT</u>	<u>CIRCUMSTANCES</u>
<u>14th Aviation Battalion</u>				
11 Feb	UH-1H	7 km west of Rockpile	174th	Hard landing
7 Mar	UH-1H	ALUOI	174th	Tail rotor strike - Tail boom buckled

FIGURE IV-34 (U). (Continued) Aircraft Accidents, LAMSON 719 (U).

3. Analysis of Accidents and Incidents

a. General

The majority of aircraft mishaps occurred in Vietnam and at the facilities listed in paragraph 4. The majority involved blade strikes of some type.

b. Rearm/Refuel

One of the most important aspects of LAMSON 719 was the preparation for and establishment of rearm/refuel points to support tactical operations. Certain areas were designated as forward refueling and rearming facilities. In some cases, such as at Khe Sanh, the area was not large enough to accommodate that number of refuel points required. This resulted in points which were too close together. The number of points had to be reduced in order to enable the dispersion of the remainder to the required distances set forth in Division Regulation 358-1. The manner in which the refuel points and rearm points at Khe Sanh and Vandergrift were of necessity laid out made it difficult to land and depart the areas when congested. Eight aircraft were involved in blade strikes at refuel and rearm points set up for the operation. Fatigue may have contributed to three incidents in that having returned from Laos to rearm or refuel, the aviators became less alert as they came back to familiar territory.

c. Dust in Landing Zones

Although only one incident directly involved going Instrument Flight Rules (IFR) in dust, the problem was common. When the landing zones were constructed and helicopters began using them, it became evident that some dust suppressant would be needed. As soon as available, penepime was applied to heavily trafficked areas. This helped reduce the dust, although it was difficult to keep a good layer of penepime on the surface because of the extreme dryness of the ground and the requirement to keep the pads operational while applying the penepime.

d. Mishaps resulting from the Tactical Situation

The overtorques and bladestrikes occurring in tactical landing zones are listed in Figure IV-35. Because of the tactical

8 February - 24 March

<u>DATE</u>	<u>TYPE ACFT</u>	<u>LOCATION</u>	<u>UNIT</u>	<u>CIRCUMSTANCES</u>
				<u>101st Airborne Division (Airmobile) Organic Aircraft</u>
13 Feb	UH-1H	Khe Sanh refuel	C/158	Blade mesh with VNAF aircraft
23 Feb	AH-1G	Vandergrift refuel	C/4/77	Flash fire at POL
23 Feb	2UH-1H	Vandergrift refuel	C/158	Meshed blades
25 Feb	UH-1H	Khe Sanh	A/158	Blade strike in landing zone, hit tree
5 Mar	UH-1H	Rockpile	C/101	Blade strike in landing zone
6 Mar	2AH-1G	Lang Con	D/101	Aircraft meshed rotor blade
15 Mar	OH-6A	Khe Sanh	163rd	To avoid midair collision, pilot dived and grazed tree

IV-138

FIGURE IV-35 (U). Aircraft Incidents, LAMSON 719 (U).

<u>DATE</u>	<u>TYPE ACFT</u>	<u>LOCATION</u>	<u>UNIT</u>	<u>CIRCUMSTANCE</u>
<u>223rd Combat Aviation Battalion</u>				
23 Feb	UH-1C	KILO	48th	On takeoff, aircraft went IFR in dust, right skid hit fence
6 Mar	UH-1H	Dong Ha	173rd	As aircraft was settling into re- vetment, maintenance operation- al check was being conducted nearby; meshed rotor blades
<u>14th Combat Aviation Battalion</u>				
11 Feb	UH-1H	7km SW of Rockpile	173rd	Hard Landing
25 Feb	UH-1H	8km NW of Khe Sanh	173rd	Main rotor blade strike
26 Feb	UH-1C	Vicinity of Vandergrift	173rd	Main rotor blade strike
27 Feb	UH-1H	DELTA	173rd	Overtorque
8 Mar	UH-1H	5km NE of Khe Sanh	173rd	Overtorque
21 Mar	UH-1H	Lang Con	173rd	Unknown
24 Mar	UH-1H	Lang Con	173rd	Overtorque

FIGURE IV-35 (U). (Continued) Aircraft Incidents, LAMSON 719 (U).

situation, heavy loads and marginal size landing zones were necessary when extracting troops.

e. Fatigue

(1) General

Fatigue was not a limiting factor in the LAMSON 719 operation. This may be attributed to the high morale of aviators and commanders that was present throughout the operation. Discussion of the operation with numerous aviators involved in LAMSON 719 did not surface any mention of fatigue. Since the aviators were flying in an extremely hostile environment, any existing fatigue was probably negated by forced alertness while over Laos. When the aviators returned to Vietnam they relaxed this alertness and experienced accidents and incidents such as inadvertent IFR when returning home or meshing rotor blades in areas which, though marginal, were adequate for safe operation.

(2) Maintenance Personnel

Monitoring fatigue was not limited to flight crews. Maintenance personnel at the battalion level and higher were monitored. There were no reported trends in fatigue among this group of individuals. However, there is no definitive system for monitoring this group.

(3) Enlisted Aircrews

Enlisted crews did not appear to be fatiguing more than aviators even though this group generally is required to work more hours per day than the aviator. Equal effort was exerted to monitor the enlisted crew members.

4. Facilities

a. Refuel Points

(1) General

In addition to the permanent refuel facilities at Quang

200
Tri AAF, additional POL areas were set up at Dong Ha, Mai Loc, Vandergrift, Khe Sanh, and Lang Con.

(2) Inspections

Quang Tri, Dong Ha, Mai Loc, and Vandergrift were inspected by the Division and Group aviation safety officers before the operation began and deficiencies were reported to the unit responsible. As a result, several refuel points at Quang Tri were moved further apart for proper separation and penprime was applied to the refuel area at Vandergrift. Khe Sanh and Lang Con were inspected shortly after they were completed. Constant maintenance was required to keep grounding cables on the nozzles at POL areas and to keep fire extinguishers charged and sealed.

b. Rearm Points

(1) General

In addition to the rearm points at Quang Tri AAF, additional rearm points were established at Dong Ha, Mai Loc, Vandergrift, Khe Sanh, and Lang Con.

(2) Inspections

Quang Tri, Dong Ha, Mai Loc, and Vandergrift were inspected by the Division and Group aviation safety officers before the operation began and all had adequate fire extinguishers. These areas were kept in a good state of police. Khe Sanh and Lang Con were inspected shortly after the rearm points were completed.

(3) Deficiencies

The takeoff lane at Khe Sanh was partially blocked by a low berm making it difficult for heavily loaded gunships to depart. This obstacle was removed as soon as the assets became available.

c. Airfields and Heliports(1) General

The majority of the airfields were able to handle the traffic despite the heavy requirements placed on them by the operation. As the attached units became accustomed to the area of operations, traffic flow became relatively smooth in and around airfields.

(2) Khe Sanh

It became evident that as the operation progressed there was a traffic control problem developing at Khe Sanh. The airfield commander published a diagram (see Figure IV-33) of the airfield which included all pads, approach and departure routes, and sector altitudes. This diagram was distributed to all aviators.

5. Comments-CO, 101st Aviation Group

In terms of the volume of aircraft and conditions encountered in LAMSON 719, the operation fared well from the aviation safety standpoint. Factors affecting aviation safety centered on the rearm and refuel facilities. Although all available support was devoted to establishing and preparing the facilities, there was not sufficient lead time between occupation of Khe Sanh and initiation of full-scale airmobile operations. Adequate lead time to permit full development of supporting facilities prior to initiation of combat operations should be provided. Experience indicated that the refuel/rearm points must be off to the side of an unobstructed lane to ensure that all points are accessible. POL points were established with 75 feet between points for UH-1 type aircraft; however, the optimum distance under operating conditions proved to be 100 feet.

P. (U) AVIATION STATISTICAL SUMMARY

1. The information contained in this summary is representative of support rendered by the aviation assets as committed to support RVNAF within the LAMSON 719 area of operations. This data does not reflect support of operations by the 101st Abn Div (Ambl) plus OPCON units in Thua Thien and Quang Tri Provinces during the period in question.

2. The time frame of 8 February - 24 March is not inclusive of LAMSON 719 in its entirety, but is representative of operations starting with the initial assaults into Laos and terminating with the final extractions from Laos excepting raids.

3. This information consists of statistical data contained in reports compiled during and upon completion of the operation. A significant representative factor in this operation was the extensive use of the UH-1H as a troop carrier (see FIGURE IV-3e). Data contained in Annex C (Aviation Statistical Summary) to this report is as follows:

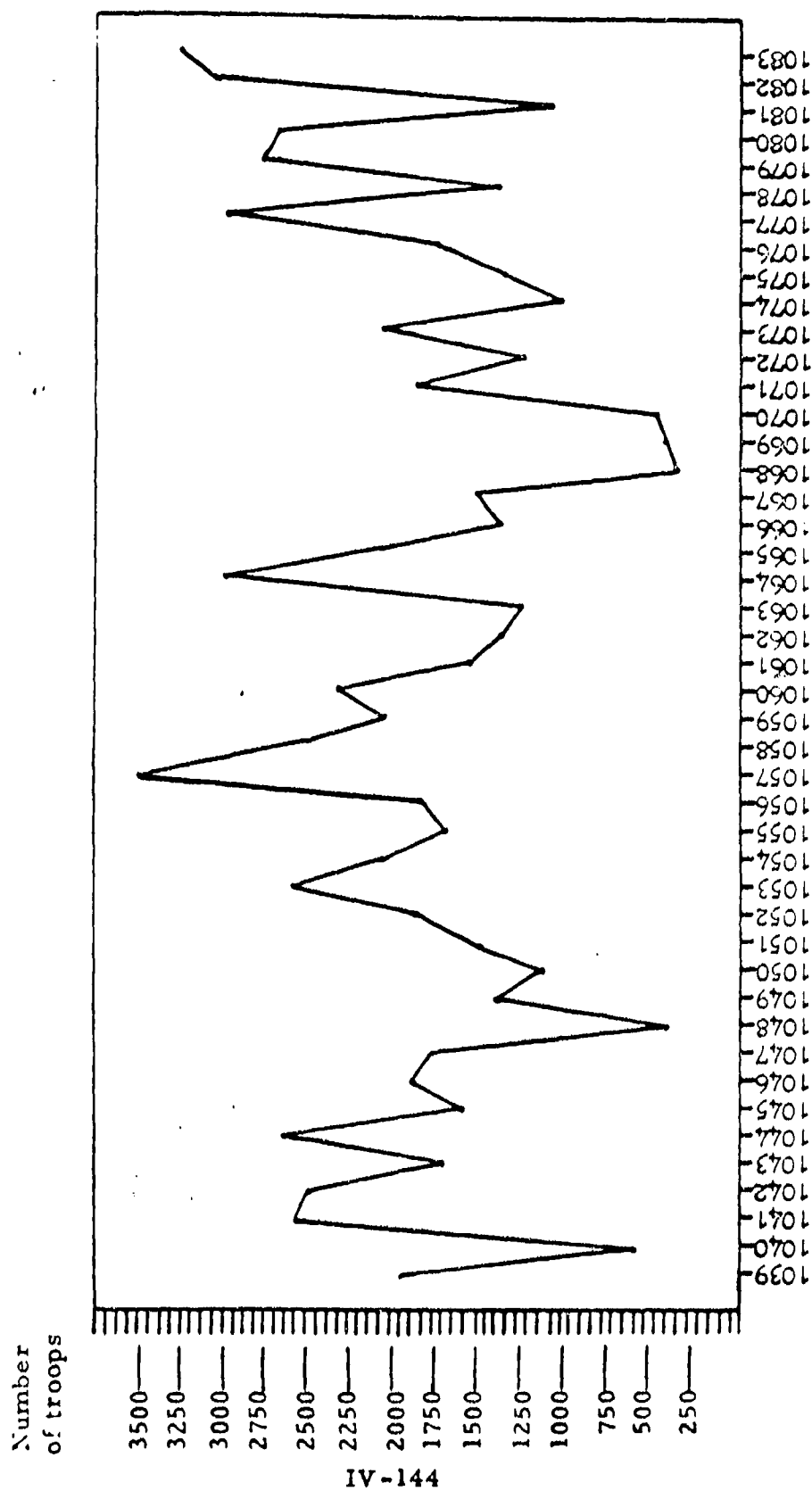
a. Cargo Transport Helicopter, Medium/Heavy Lift (CH-47, CH-53 and CH-54) data which includes the number of aircraft utilized, movement of supplies, movement of passengers, sorties, and flying hours.

b. Utility/Tactical Transport Helicopter (UH-1H) data which includes the number of aircraft utilized, movement of passengers, sorties, and flying hours.

c. Attack/Observation Helicopter (UH-1C, AH-1G, and OH-6A) data which includes the number of aircraft utilized, sorties, and flying hours.

d. Recapitulation which includes
(1) A recapitulation of performance/utilization data for items 6a, 6b, and 6c.

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(26 Mar)

Julian Dates

FIGURE IV-36 (C). Troop Lift UH-1H (U)

(8 Feb)

26

(2) Comparative totals for all aviation support rendered by the 101st Airborne Division (Airmobile) units during 8 February-24 March 71.

e. LAMSON 719 sortie data which reflects in country and out country sorties by type mission (i.e., troop lift, helicopter gunship, MEDEVAC, air cavalry, and logistic) for each day and totals for the period.

f. AH-1G/UH-1C gunship statistical data which is presented as a basis for further comparison of AH-1G/UH-1C gunship utilization and effectiveness.

267
CONFIDENTIAL

2. (C) COMBAT DAMAGE

1. General

Combat damage information was collected for helicopter assets of the 101st Airborne Division (Airmobile) which operated in the LAMSON 719 environment. There were 644 aircraft damage incidents to 451 different aircraft and a total of 90 aircraft lost. Annex D contains the chronological summary of this data further organized by series helicopter. Reviewing this data, preliminary conclusions were reached regarding the damage helicopters received from the enemy.

2. Light Observation Helicopters

Commanders occasionally limited the role of the OH-6A in the hostile antiaircraft environment of LAMSON 719. There were 22 of these aircraft which received battle damage on 34 different occasions. Two-thirds of the incidents of damage occurred as these aircraft were flying within 100 feet of the ground. Six of these aircraft were reported lost; one to RPG, one to small arms fire, one to antiaircraft fire, three to 12.7mm fire.

3. Attack, Utility, and Medium Lift Helicopters

The AH-1G, UH-1C, UH-1H, and CH-47 aircraft were studied. Graphs at Figures IV-37 through IV-40 show the number of these aircraft hit versus lost, by Julian Date.

a. The data base shows that 101 different AH-1G aircraft were damaged on 152 occasions. Eighteen were lost; seven to small arms fire, six to 12.7mm fire, three to mortar fire, and two to enemy rockets at Khe Sanh. Eighty-one hit occasions involved AH-1G aircraft in the target attack phase of flight. This durable aircraft was hit by 12.7mm fire on 71 occasions and survived 92 per cent of these.

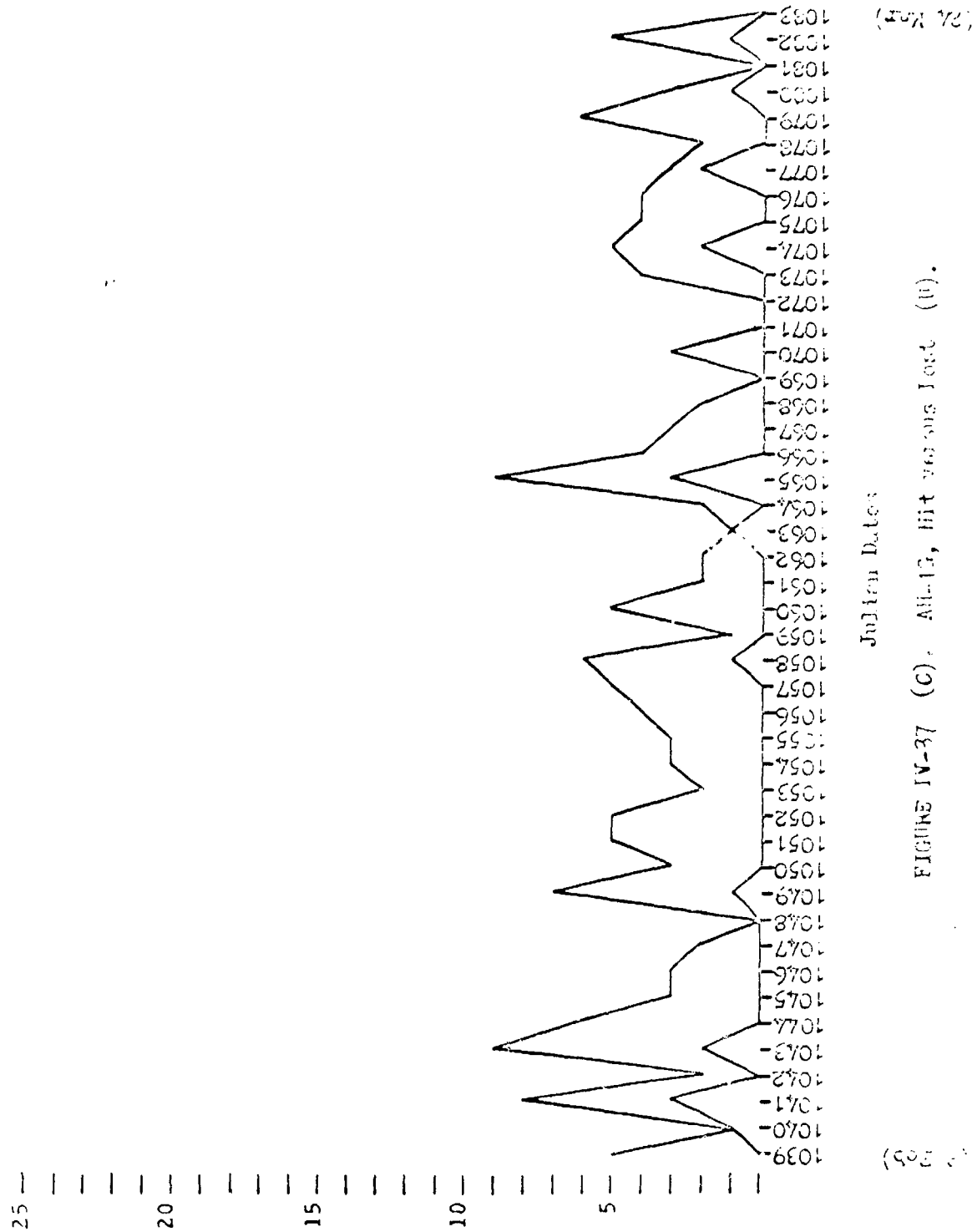
b. Forty-eight different UH-1C aircraft were damaged on 66 different occasions. There were twelve lost; four to small arms fire, four to 12.7mm fire, one to RPG, two to satchel charges, and one by unknown enemy fire received in the target attack phase of

IV-146

CONFIDENTIAL

CONFIDENTIAL

208

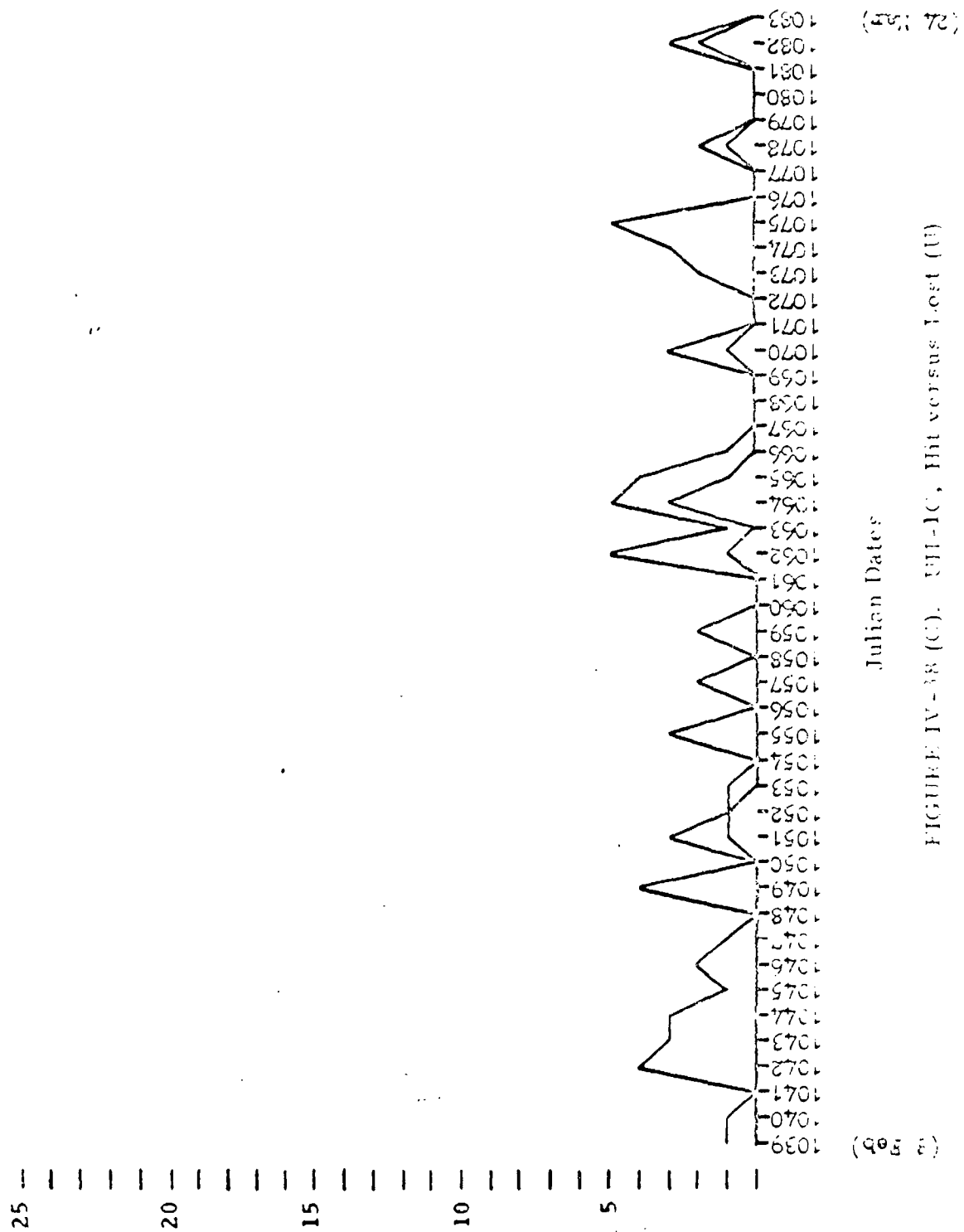


IV-147

CONFIDENTIAL

CONFIDENTIAL

269



IV-148

CONFIDENTIAL

CONFIDENTIAL

270

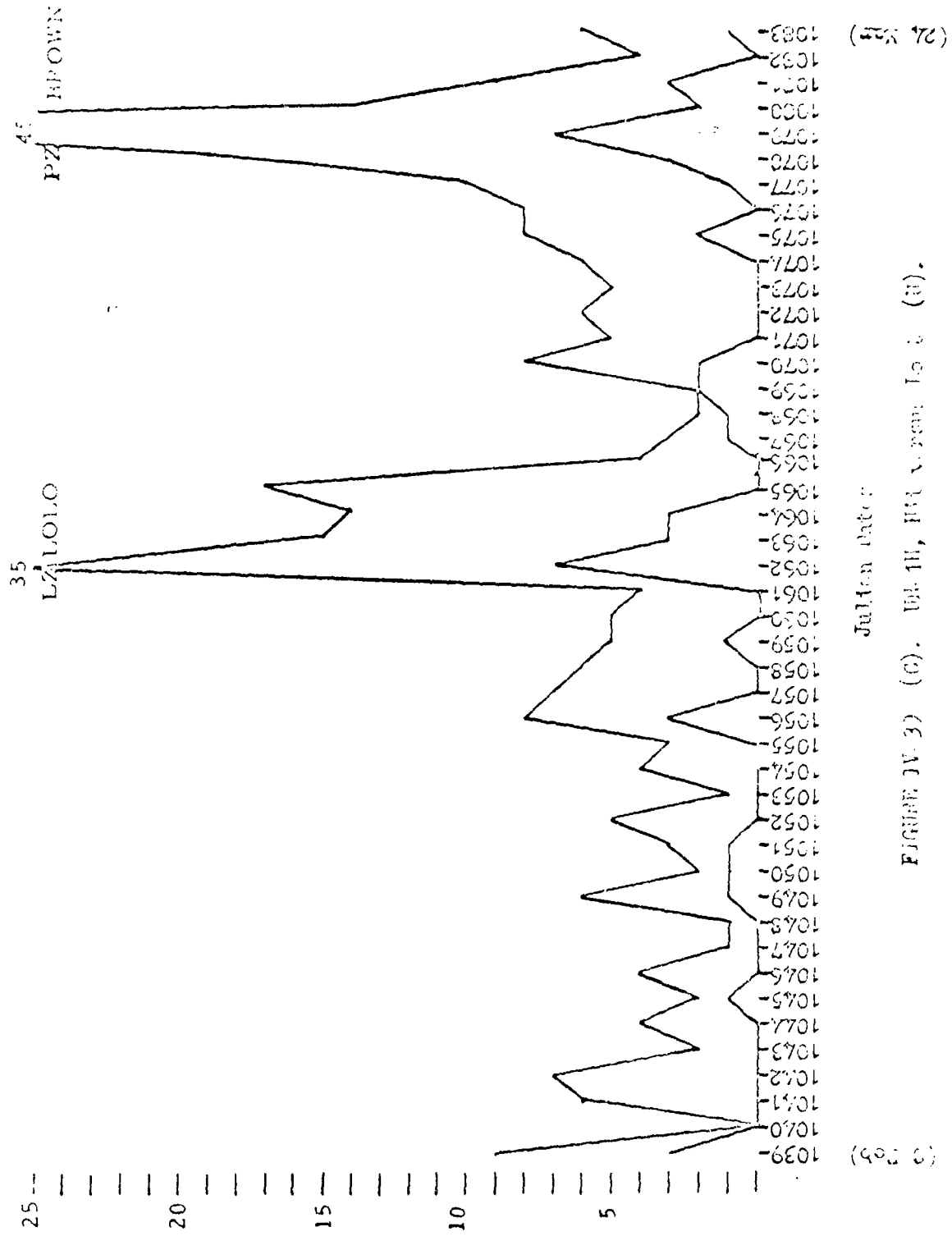


FIGURE IV-30 (C). HP OWN, LZ LOLO (U).

IV-149

CONFIDENTIAL

CONFIDENTIAL

271

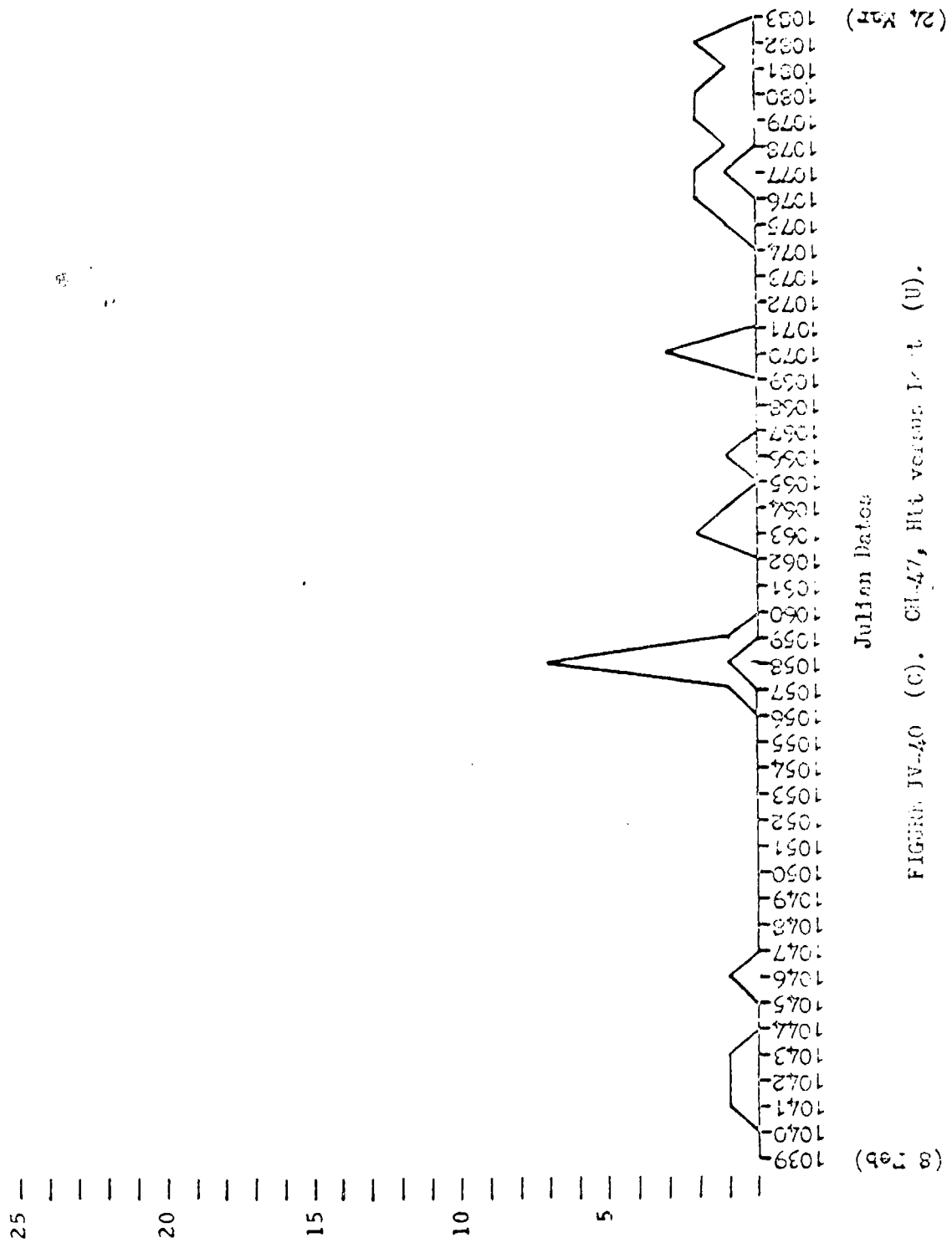


FIGURE IV-40 (C). CH-47, HUI versus I-1 (U).

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flight. Forty-two hit occasions involved aircraft in the target attack phase of flight. This aircraft was hit by 12.7mm fire on 27 different occasions, surviving 85 per cent of these. These aircraft lacked the performance characteristics of the AH-1G.

c. Two hundred and thirty-seven UH-1H aircraft were damaged on 344 different occasions. Forty-nine aircraft were lost; sixteen to small arms fire, fifteen to 12.7mm fire, ten to mortar fire, two to rocket fire, two to antiaircraft artillery fire, two to RPG, and two to enemy artillery fire. Thirty-nine losses occurred in conjunction with operations in and around the landing or pickup zone. One hundred and seventy-four hit occasions involved 12.7mm fire. Sixty-one per cent of the aircraft damaged were hit within 100 feet of the ground; of these, 77 per cent were landing, landed, or departing an LZ or PZ. Nearly twenty-nine per cent of all the UH-1H losses occurred on 3 March and 20 March 1971, with respective operations to assault LOLO and to extract forces near BROWN. Altogether there were 84 incidents of damage to UH-1H helicopters on these two days.

d. Thirty CH-47 aircraft were damaged on 33 different occasions. Three were lost; one when hit by mortars, one after receiving battle damage involving an engine, the third after the hydraulic system was hit by small arms fire while the aircraft was enroute.

4. Heavy Lift Helicopters

Fourteen CH-53 aircraft were hit by enemy fire. Two were lost; one when hit by mortar fire while hovering, the other enroute to its home station after having apparently received damage to the main rotor system. Only one CH-54 aircraft was damaged. It was struck by mortar fragments while at Khe Sanh.

5. Combat Exposure

Using sortie information from the Aviation Statistical Summary, combat damage rates were established and then compared for aircraft operations over Laos and the Republic of Vietnam, during LAMSON 719. This comparison showed that the threat of damage was thirteen times greater when flying in Laos. One incident of damage occurred

IV-151

CONFIDENTIAL

CONFIDENTIAL

per 1000 sorties outside Laos whereas thirteen incidents occurred per 1000 Laotian sorties. An average of nearly two aircraft were lost for every 1000 Laotian sorties.

IV-152

CONFIDENTIAL

SECTION V

RAIDS

A. (U) CONCEPT1. Purpose

Raids were planned following RVNAF withdrawal from Laos to destroy enemy logistic installations, disrupt NVA command and control facilities, and continue to demonstrate RVNAF capability to strike the enemy in his base areas in Laos.

2. Mission

The 2d Squadron, 17th Cavalry, with the HAC BAC (OPCON), supported by 101st Abn Div (Ambl) and USAF aircraft, was given the mission of conducting a raid on enemy logistic and headquarters elements in Laos. The planned location was approximately 45 km SSW of Khe Sanh. This initial raid was scheduled for 29 March 1971.

3. Guidance

- a. Good weather for at least three days had to be forecast.
- b. The raid had to offer a very high probability of mission accomplishment with minimum aircraft and personnel losses.
- c. The operation was to be of short duration with decisions to insert and extract to be mutually agreed upon by the US and Vietnamese commanders involved.

B. (U) INITIAL EFFORTS

1. Based on aerial photos, visual reconnaissance, and information obtained from ARVN, the target area landing zones were selected on 28 March 1971. Concentrated B-52 strikes were conducted on the area during the night of 28 March and early morning of 29 March. Commcon FAC coverage was programmed for the 29th, with sufficient tactical sorties to neutralize anti-aircraft weapons along the approach routes, departure routes, and objective areas.

2. The Cav team assigned to work the area on the 29th encountered two significant problems: the area was well protected with large caliber antiaircraft weapons, and the visibility in the area was too poor for effective employment of PAC controlled air strikes.

3. US and Vietnamese commanders involved made the decision to postpone the raid, and to consider instead other raids on different targets at a later date. It was no longer feasible to strike the original target area, since the extensive air activity in the area had in all probability revealed friendly intentions to the NVA.

C. (3) FIRST RAID

1. A second attempt was scheduled for 31 March 1971. Again the HAC BAO Company was to be employed, with the target area this time approximately 45 km SE of Nhe Sanh, approximately 8 km into Laos. Essentially the same guidance was given for this raid as for the earlier attempt.

2. Extensive B-52 strikes and tactical air were employed in the area prior to insertion of the HAC BAO. In addition, three air cavalry troops worked the immediate objective area, with an additional troop screening to the west. Upon insertion, the ground elements encountered light resistance, and killed one NVA while taking one casualty. HAC BAO also discovered the bodies of 34 NVA killed by Air Force, and numerous bunkers and fighting positions destroyed. Cav troops working the area killed six NVA during the mission, and employed air strikes resulting in one secondary explosion.

3. During the night radio contact was maintained with the ground unit through an airborne automatic retrans station; the ground unit reported hearing and seeing approximately 70-80 trucks moving to their south, and this sighting was verified by an Air Force TAC. TAC air was employed on the convoy, resulting in numerous large secondary explosions. The morning of 1 April the HAC BAO Company was extracted with only light ground fire reported by the extraction aircraft.

277

D. (U) SECOND RAID

1. A second raid was scheduled for 6 April 1971 with the objective area located in the Laotian salient approximately 21 km south of Khe Sanh. The guidance for previous raids remained in effect, and essentially the same USAF preparation was used. The HAC BAO Company was inserted into an inactive landing zone at 060955 April and extracted at 061717.

2. Results of this operation were 15 NVA killed, 13 tons of rice destroyed by HAC BAO, 17 enemy weapons (AK-47) destroyed, along with numerous bunkers, huts, and fighting positions destroyed. During the operation the Air Force destroyed two 12.7 mm anti-aircraft weapons, one 37 mm anti-aircraft gun, both confirmed by the HAC BAO, and observed three secondary explosions.

E. (U) CONCLUSIONS

The results of these raids are as yet not fully assessed. The observed enemy casualties and damage were in themselves significant. More significant and still largely undetermined is the impact on the NVA of the realization that RVNAF has the capability to strike deep into his base areas, thereby denying him the protection of these formerly safe havens.

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SECTION VI

INITIAL RESULTS

A. (U) GENERAL

This section is not intended to be used as an analysis of the success or failure of LAMSON 719 but to describe briefly the more significant initially observed results of the entire combined air-ground operation. Total enemy casualties and supplies destroyed or damaged as they relate to the three primary objectives of the operation are discussed. Data was collected from XXIV Corps and I Corps sources and will in all probability differ from later reports from headquarters with wider access to operational data. Direct assessment by 101st Airborne Division (Airmobile) units of destruction and damage was limited to aerial observation. Most of the significant results were assessed by RVNAF ground reconnaissance and reported to I Corps.

B. (C) FULFILLMENT OF PRIMARY OBJECTIVES1. Destruction of Enemy Stockpiles

a. Prior to the operation, intelligence reports indicated that during December and January there was a sharp increase of supplies being moved by the NVA into Base Area 604, and that only a small portion of these supplies had been moved on to the south. A detailed target analysis of the area resulted in the identification of five depot areas. Within these five depots, a total of 325 targets were identified and targeted. These consisted of caches, structure complexes, truck parks, and supply points.

b. In response to this targeting intelligence, US combined firepower was used to complement and support the RVNAF ground effort. B-52 strikes were conducted in support of the operation. It is estimated that a minimum of 50 per cent of the 325 targets identified in Base Area 604 were destroyed or received major damage. Available reports to date indicate that there were 5,379 sorties flown by tactical air support from 8 February to 24 March. Additionally, over 22,000 helicopter gunship sorties were flown in support of troops engaged in detailed search and destroy operations in the objective areas. There were also over 27,000 rounds of 8 inch, 175mm artillery fired by US artillery in support of LAMSON 719 in Laos and western Quang Tri province of South Vietnam.

VI-1

CONFIDENTIAL

CONFIDENTIAL

280

C. (C) DIVISION G-2 COMMENTS

The time required to restore the severed lines of communication and supply and transportation facilities, and to retrain and retrain the combat and service and support units destroyed during Operation LAMSON 719 could be significant. In addition to the enemy's losses in manpower and material, the loss of highly skilled and experienced supply, transportation, communication, maintenance and security personnel could further delay the rebuilding by the enemy of that portion of his complex, strategic logistic network. The accuracy of this prognosis will only be known in the summer and fall of 1971 when the enemy will rely on supplies which should have been moved through Laos this spring to support his operations.

VI-3

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ANNEX A INTELLIGENCE

1. (U) INTRODUCTION

This section contains a summary of weather conditions, terrain data, and the general enemy situation during Operation LAMSON 719. Information on the enemy situation is somewhat limited by the classification of this report; however, every effort has been made to insure all available information of the proper classification is included so as to present as accurate a picture as possible.

2. (U) Weather

a. General

During most of February and the first half of March the Siberia High normally present over the mainland of Vietnam, begins a slow retreat northward. The flow around the high is still sufficient however to maintain a strong northeast monsoon over Southeast Asia. As the cold dry air from the high pressure area moves southward, it is gradually heated by contact with the warmer China coast and waters of the South China Sea. This polar air merges over the water with moist tropical air from the western Pacific and arrives over Southeast Asia much warmer and more moist than when it left the continent. The northeast monsoon over northern South Vietnam is a wet monsoon with considerable low level cloudiness, light rain, and drizzle. The Annamite Mountain Range along the border of Laos and South Vietnam weakens the effects of the northeast monsoon in Laos; however, considerable low level cloudiness is present along the border regions of Laos and South Vietnam during the northeast monsoon. The amount of cloudiness in this border area on any given day depends primarily on the strength and depth of the northeast monsoon. The northeast monsoon is relatively cool and dry over much of the interior of Laos.

b. Northeast Monsoon

If a moderate northeasterly flow of 15 to 25 knots is present through the first eight to ten thousand feet above the ground, (Figure A-1) "spill over" into Laos will occur. This "spill over" will produce

ANNEX A

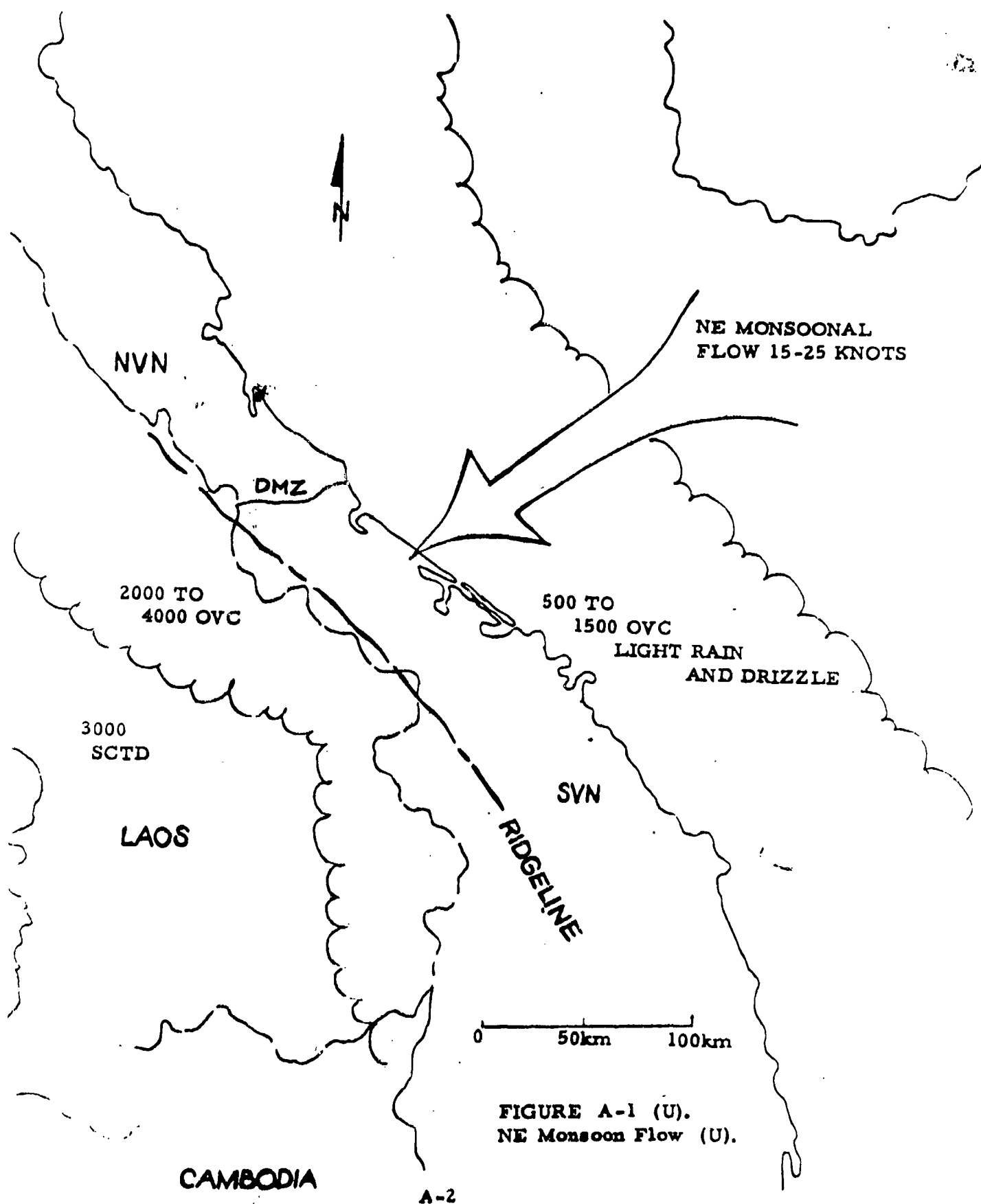


FIGURE A-1 (U).
NE Monsoon Flow (U).

A-2

ceilings from 2,000 to 4,000 feet above mean sea level extending 50 to 70 miles into eastern Laos, becoming mostly scattered in western Laos. This same flow pattern will cause ceilings to average between 500 and 1,500 feet with light rain and drizzle along the coastal areas of South Vietnam. All higher elevations will be obscured in clouds.

c. Transition (Figure A-2)

During the latter half of March, the northeast monsoon weakens causing an improvement in the weather over most of the Laos-South Vietnam border area. Considerable cloudiness will still occur over the Annamite Mountain Range, however, with ceilings averaging between 2,500 and 4,000 feet. The border areas of Eastern Laos will experience mostly scattered clouds during the afternoon. Low stratus and poor visibility in valley fog will dominate the weather during the early morning hours.

d. Southwest Monsoon

The initial stage of the Southwest monsoon, experienced in surges during late March, consists of a light southwesterly wind pattern (Figure A-3). During this flow configuration showers and thunderstorms develop over and along the Annamite Mountain Range, causing mostly cloudy weather. Scattered thundershowers with bases of 3,000-4,000 feet will develop over the area by mid afternoon. The plains of Vietnam by late afternoon provided the upper level wind flow is greater than 15 knots from the southwest.

e. Aviation Weather

1. Aviation support was affected by weather in three separate regions. The majority of aircraft were based in the Vietnamese coastal plains, crossed the Annamite chain, staged at Khe Sanh and then operated in eastern Laos. Under most conditions, the weather was marginal in one of the three areas during most of the period. Ceilings of 1,000 feet above ground level (AGL) were used as a minimum standard for effective operation of Army aircraft, whereas ceilings of 3,000 feet AGL were used for employment of normal USAF TAC air support. Data in Figure A-4 is derived from USAF observation stations in the Coastal Plains. No weather stations were established

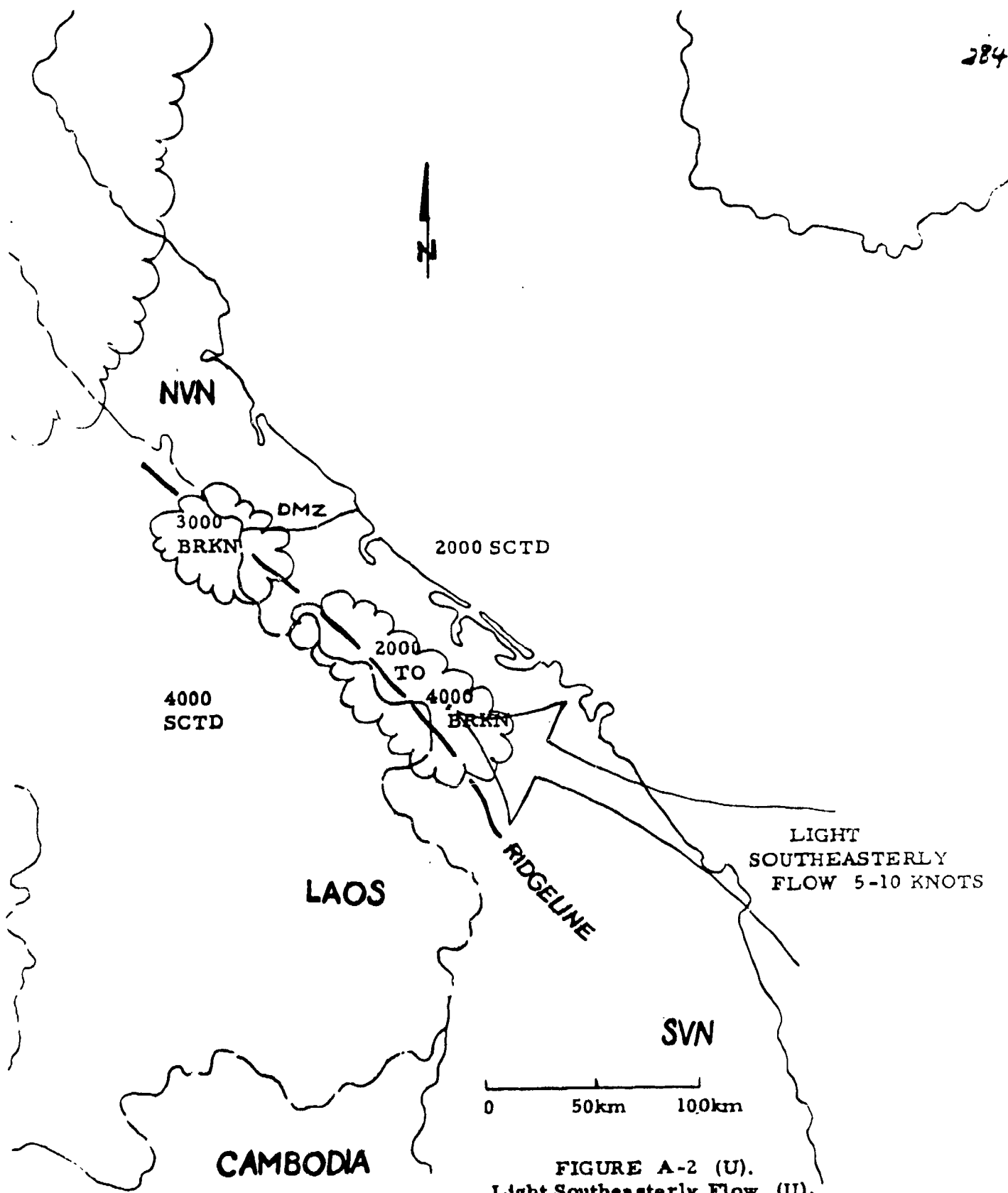
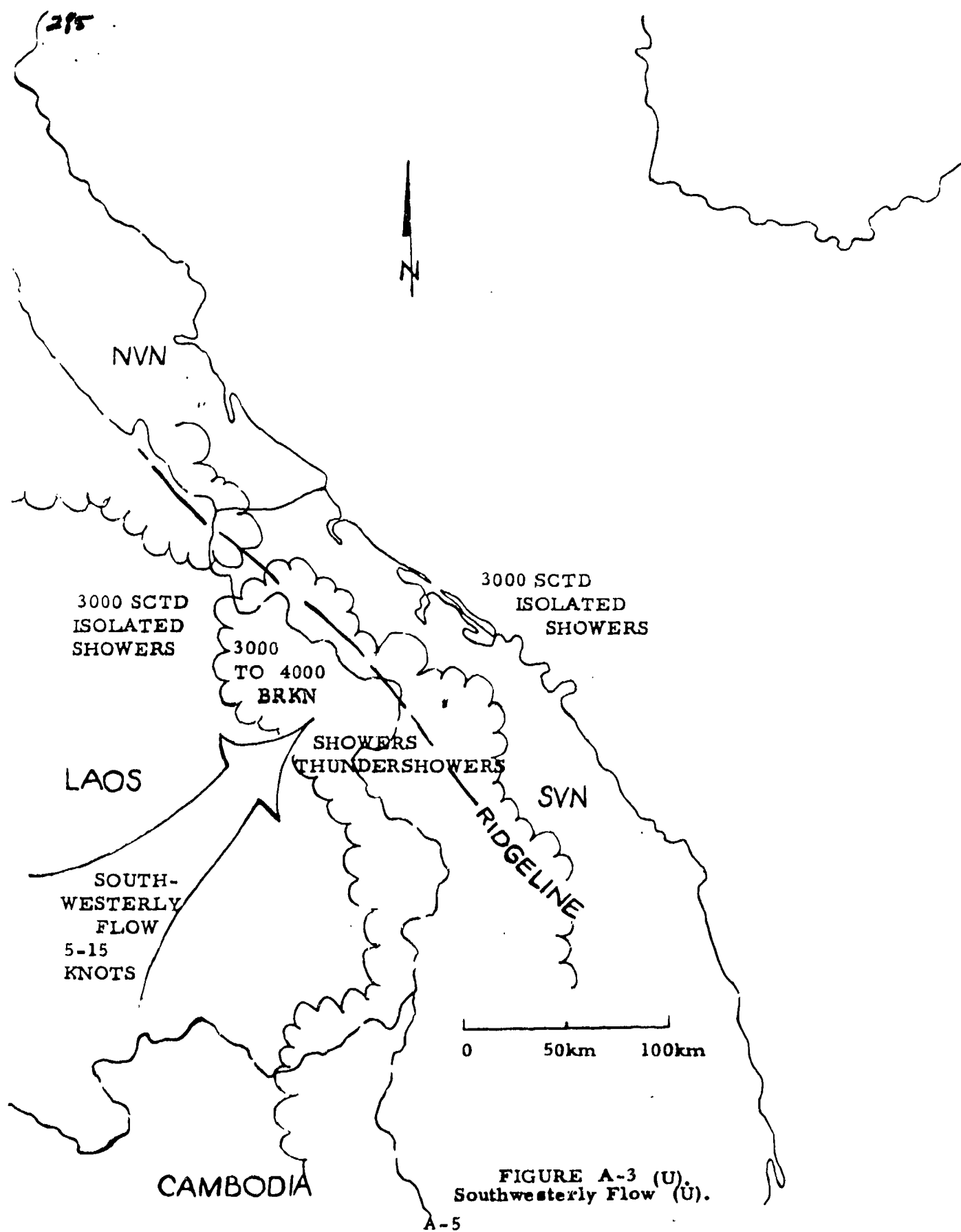
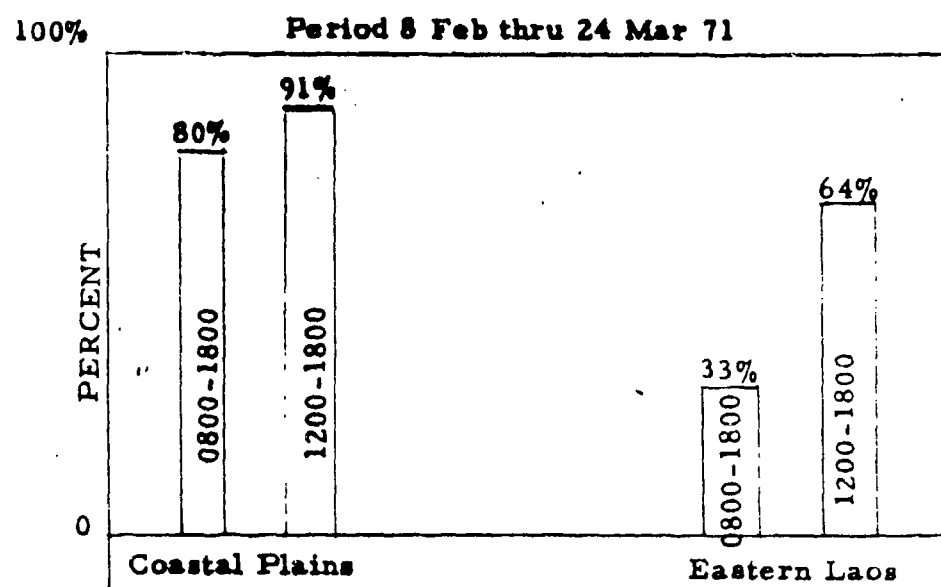


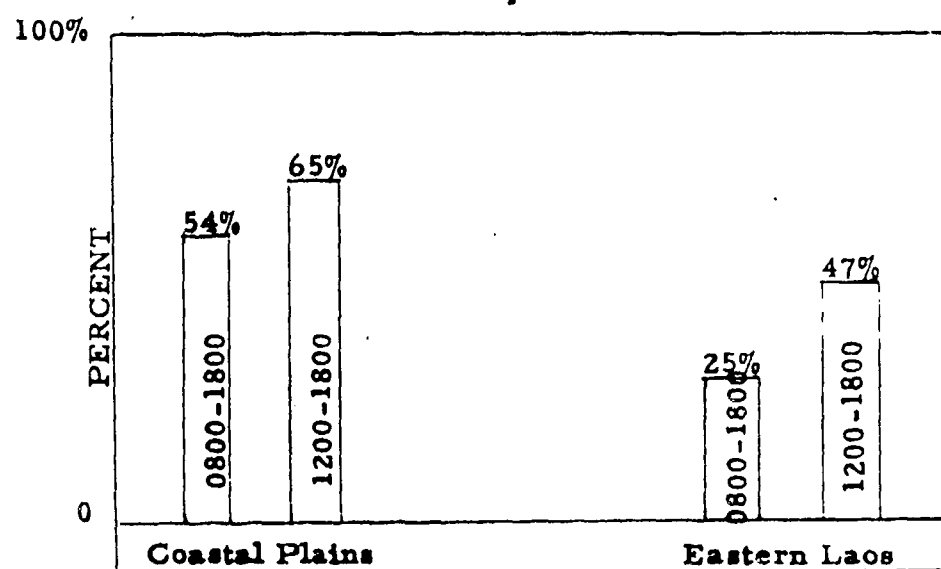
FIGURE A-2 (U).
Light Southeasterly Flow (U).

A-4





Ceilings of 1000 feet (AGL) or better



Ceilings of 3000 feet (AGL) or better

FIGURE A-4 (U). Aviation Weather Minimums (U).
A-6

in Laos, and percentages were obtained for eastern Laos from extrapolation of weather data reported from Khe Sanh. In general, a ceiling above 2,500 feet along the coastal lowlands resulted in ceilings above 1,000 feet in the operational area.

2. Ceilings in the eastern Laos operational area were above 3,000 feet AGL from 0800H daily for approximately 25 per cent of the days being considered. Ceilings along the coastal area of MR-1 above 3,000 feet AGL from 0800 to 1800 daily averaged 54 per cent of the period. The same requirement was met for approximately 47 per cent of the period from 1200 to 1800H daily over the Laos operational area and 69 per cent over coastal areas of Military Region 1. A ceiling above 1,000 feet AGL was reported in the Laos operational area from 0800H to 1800H daily for approximately 33 per cent of the period of operation, while the same requirement was met in approximately 64 per cent of operational period from 1200H to 1800H. Ceilings were above 1,000 feet from 0800H to 1800H daily over the coastal plains of Military Region 1 approximately 80 per cent of the period of operation. The same requirement was met for approximately 91 per cent of the operational period from 1200 to 1800H daily over the coastal plains. In general a ceiling of 2,500 feet or better along the coastal areas of Military Region 1 during light to moderate northeasterly flow will result in ceilings above 1,000 feet over the operational area in Laos.

3. (U) DESCRIPTION OF THE OPERATIONAL AREA

a. Geography

Operation LAMSON 719 was conducted in Tchepone District of Savannakhet Province, in southeastern Laos (Figure A-5). The area is bounded on the east by Quang Tri Province, SVN, with the Demilitarized Zone and Quang Binh Province, NVN, to the immediate northeast. The area is largely uninhabited, with the exception of Laos tribesmen and refugees from the Khe Sanh area of SVN. All major villages and towns in the area have either been destroyed or abandoned. The operational area is traversed from southeast to northwest by the Xe Pon River, and from northeast to southwest by the Xe Bang Hiang River. These rivers join in the vicinity of the abandoned district capital of Tchepone. The Xe Namko River enters the operational area from the west and also joins the Xe Bang Hiang at Tchepone.

b. Landforms (Figure A-9)

The area may be generally described as the western slopes and foothills of a portion of the Annamite Mountain Chain. The predominant land feature is the escarpment, or bluff (elevation 600-700 meters) running south of, and generally parallel to the Xe Pon River.

(1) Mountains

Elevations of the mountains in the area generally decrease from east to west. The highest elevation in the LAMSON 719 area is 1104 meters, located in the northeast sector along the Laos-South Vietnam border. To the west, hills north and south of Tchepone have an elevation of approximately 300 meters. The escarpment rises sharply 400-500 meters above the Xe Pon River valley.

(2) Plains

Vegetation in the lowlands is composed primarily of brushwood and single canopy light undergrowth forest. The brushwood areas consist of grass, bushes, secondary scrubs, and elephant grass. They are discontinuous and vary in density from extremely heavy to moderately open. The single canopy forest averages 20 meters in height with scattered individual trees with heights to 30 meters.

c. Lines of Communication(1) General

The roads and trails that extend through the LAMSON 719 area of operations form a major access route for the enemy's logistic system into the Republic of Vietnam (RVN). These routes are a part of an intricate network over which the North Vietnamese (NVA) can move supplies during most of the year either by trucking and/or portering. Following the halt of US bombings of North Vietnam in November 1968, the North Vietnamese began an extensive road building program. At that time enemy supplies and infiltrating personnel were exiting North Vietnam primarily through the Ban Karai and Mu Gia Passes, on the Laos/NVN border north of LAMSON 719 area. As

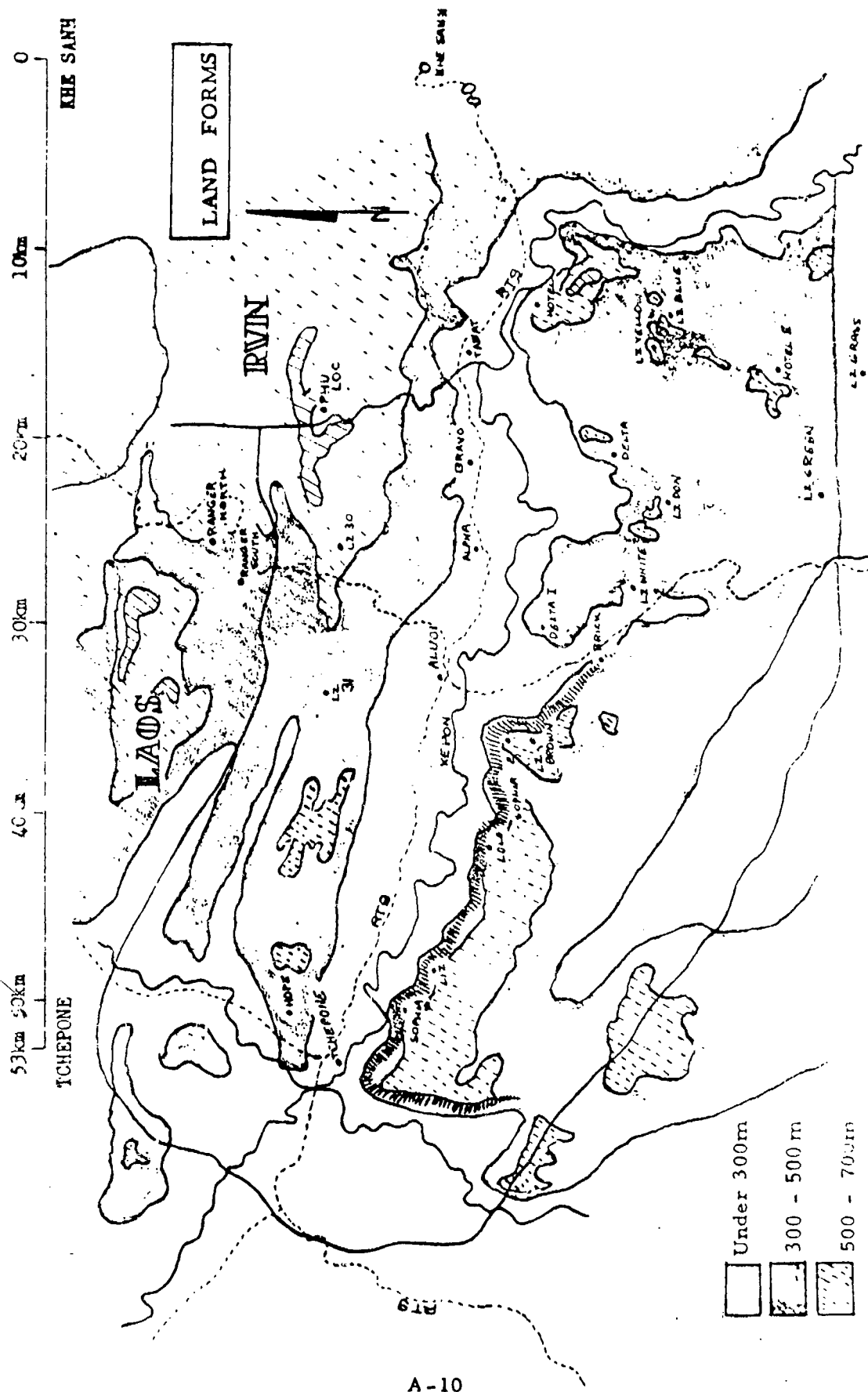


FIGURE A-6 (U) Landforms (U).

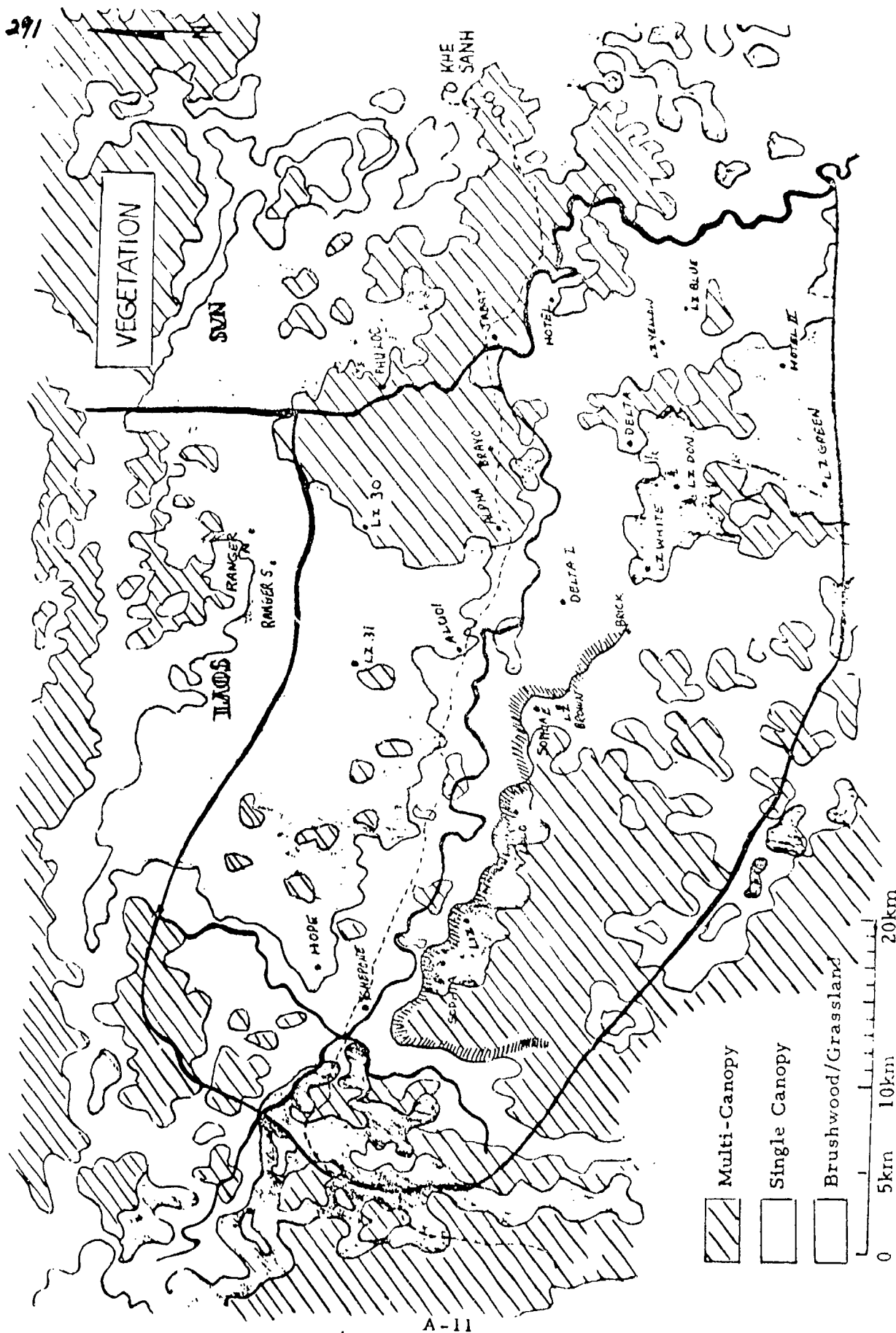


FIGURE A-7 (U). Vegetation LAMSON 719 (U).

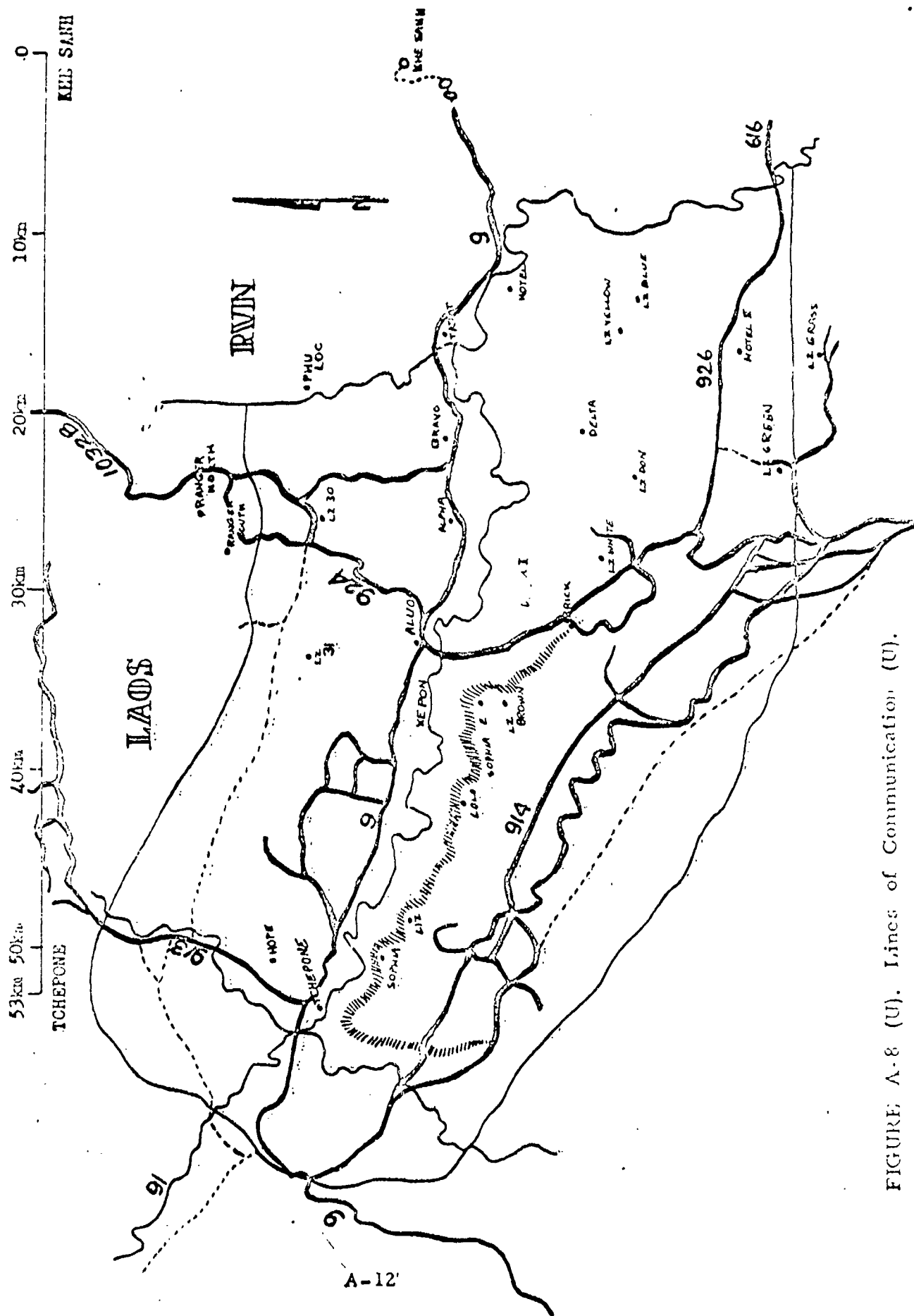


FIGURE A-8 (U). Lines of Communication (U).

a result of the bombing halt, the enemy began improving and extending those roads leading south out of Dong Hoi. These routes were more direct than those to the west and afforded the best potential for wheeled vehicle access to both Laos and South Vietnam. By 1970 the NVA had completed a route through the Ban Raving Pass (immediately north of the DMZ) and connected it with routes running into the Tchepone area of Laos. Following this the NVA completed routes that would sustain vehicular traffic, passing through the western DMZ, south into Laos west of northern Military Region 1, and into the LAMSON 719 area of operations.

(2) Major Routes

(a) 1032B

Enters the LAMSON 719 area of operations in the north-east corner and extends southward from the DMZ to its junction in the Ban Dong area (objective ALUOI) with Routes 92C/9G. This route is a major segment in the enemy's main north-south supply route. Route 1032B is a nearly two-lane wide, well-engineered road that was completed for use by heavy cargo vehicles, but is capable of sustaining light truck traffic. Heavy Air Force interdiction efforts have resulted in several by-passes being built near fords and other choke points.

(b) Route 92C

Laos Route 92C is completely in the LAMSON 719 area of operations. It is in the southeastern portion of the area and extends in a southeast direction from its junction with Routes 1032B/92C enemy supply route through the LAMSON 719 area into enemy Base Area 611. Route 92C varies from 2.5 to 3 meters in width. The drainage along the roadbed is natural. Road corduroying is fairly extensive and enhances the allweather capability of the road. During the Southwest Monsoon season flooding may occur; however, natural drainage is generally sufficient to prevent a major problem. The road is used extensively, and the enemy attempts to keep the road open throughout the year.

(c) Route 9H/9G

Laos Route 9H/9G traverses the LAMSON 719 area in a generally west to east direction from Tchepone to the Vietnam border, where it becomes Route QL-9. Dense undergrowth and thirteen destroyed bridges along this former international highway hinder any fast crosscountry movement. Major construction would be required before this is two lanes wide and is capable of sustaining a heavy volume of vehicular traffic.

(d) Route 926/616

Route 926 extends eastward from a junction with Route 92C in the southwestern portion of the operational area. It enters southwestern Quang Tri Province, RVN, as Route 616. Route 616 eventually intersects Route 548 in the A Shau Valley. Route 926 received extensive road repair work during the early dry season and its condition approaches the status of an all weather road. This road is two lanes wide and will sustain a heavy volume of vehicular traffic. Route 616, the incountry extension of Route 926, received extensive road repair work during November and December 1970. Route 616 is two lanes wide up to the vicinity of FB SPARK, but is interdicted in several areas due to Air Force air strikes. The trafficability of the route is also severely hampered during periods of poor weather.

(e) Route 913

Route 913 enters the LAMSON 719 area of operations to the northeast and forms the second major segment in the NVA's north south supply route. To the north, Route 913 connects with Route 92A and 1039 running through the Ban Raving Pass. The Route is a well-engineered, two-lane, continually maintained road. The road surface approaches the classification of an all weather road; however, near fords and low areas traffic is limited during the wet monsoon period.

CONFIDENTIAL

295

4. (C) ENEMY ACTIVITY

a. Strengths, Disposition, and Movement

(1) Prior to Operation LAMSON 719 (Figure A-9)

Enemy forces in and near the operational area prior to the initiation of Operation LAMSON 719 on 8 Feb 71 were estimated to number 22,000. Of this total, 13,000 were in combat units, and 9,000 were supporting and maintaining the extensive infiltration network.

(a) Combat

Units in the area consist of elements of the 24B Regt/304th Div, the division headquarters and 1st VC Regt/2d Div, and the 64th Regt/320th Div. The 24B Regt had remained in the area north-east of Ban Dong when the remainder of the 304th Div (9th and 66th Regt's and the Div HQ) were deployed to NVN after the summer of 1970. The 24B Regt had the mission of guarding the Route 9 approach into the Tchepone area. The HQ 2d Div and the 1st VC Regt/2d Div were in the Tchepone area, refitting after operations in southern MR-1 in the summer of 1970. The 64th Regt/320th Div was north of Base Area (BA) 604, infiltration south along Route 913.

(b) Logistic

The enemy forces supporting the logistic network were subordinate elements of the 559th Transportation Group, called Binh Tram (military stations). These elements were responsible for the movement of infiltrating personnel and supplies through their assigned areas of responsibility. In order to accomplish this mission, each Binh Tram had a mix of attached transportation, engineer, medical, communication, liaison, and antiaircraft battalions. Each Binh Tram had infantry forces up to battalion size for internal security, although all attached units had a secondary mission of fighting as infantry as required. Binh Trams in the operational area consisted of probably two unidentified Binh Trams north of the immediate operational area; one unidentified Binh Tram in the Tchepone area; Binh Tram 33 which had the mission of moving supplies from south of Ban Dong (objective ALUOI) toward southern MR-1 and BA 611; Binh Tram 41, which

A-15

CONFIDENTIAL

296



FIGURE A-9 (C). Enemy Disposition 1 February 1950.

CONFIDENTIAL

received supplies from Binh Tram 33 and moved them east along Rte 926/616; and Binh Tram 34, which received supplies from Binh Tram 33 and moved them south toward southern MR-1.

(c) Air Defense (Figure A-10)

Antiaircraft units were normally subordinate to the Binh Trams with a mission of protecting the infiltration network from allied surveillance and interdiction. Each Binh Tram controlled possibly as many as three AA bn's of varying caliber, from 12.7mm through 100mm. The medium caliber (23mm through 100mm) coverage of the LAMSON 719 area posed a formidable threat to allied air support. It was estimated that there were as many as 19 battalions of 150-200 medium caliber weapons deployed along the route structure. No estimate was made of small caliber weapons (12.7mm and 14.5mm). Subsequent experience proved that these type weapons supplemented and protected the larger caliber weapons.

(2) During Operation LAMSON 719 (Figure A-11)

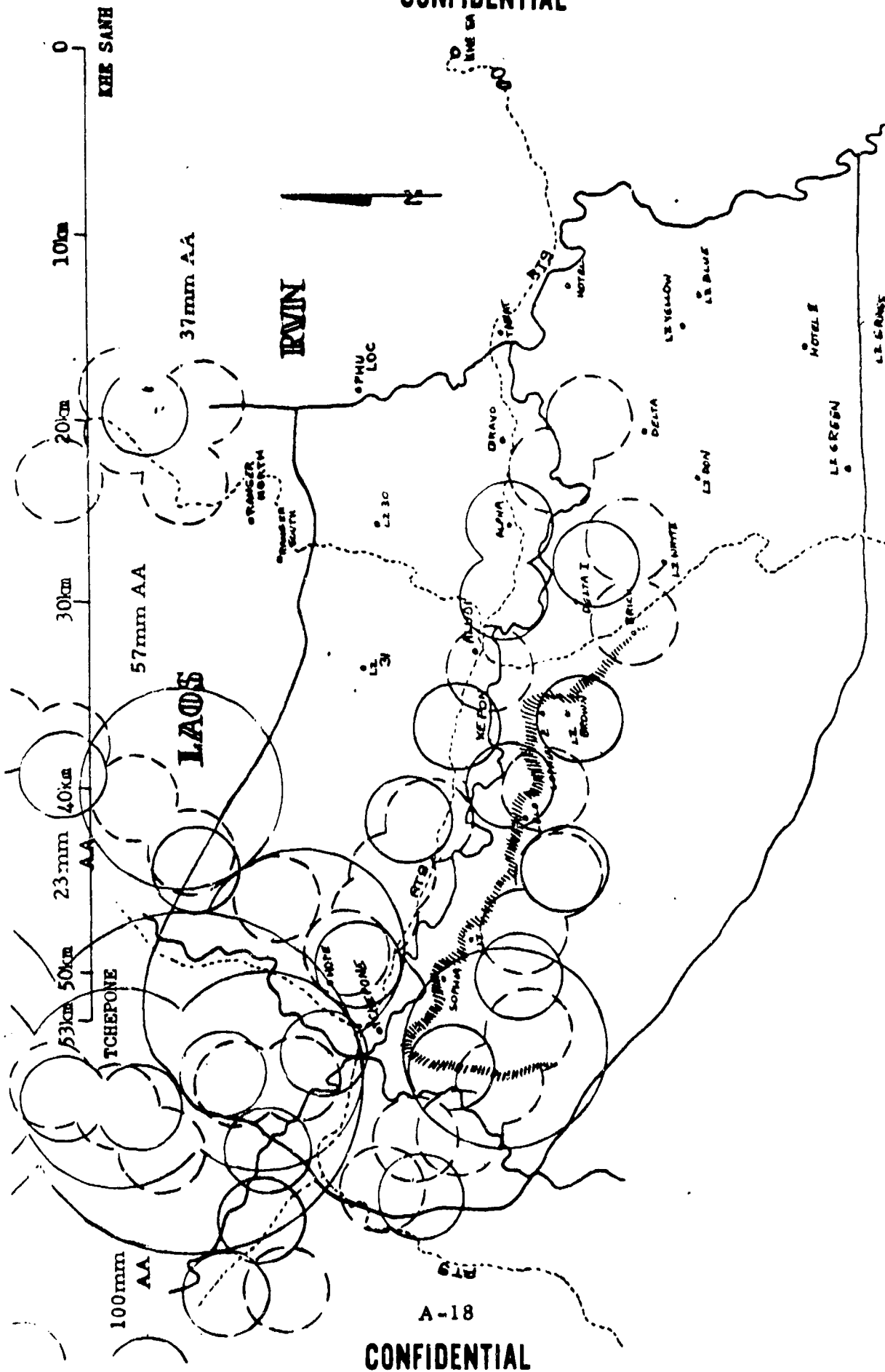
(a) In late January, a new corps level headquarters infiltrated from north of the DMZ to an area north of ARVN Ranger FB's along Route 1032B. This headquarters, designated the 70B Front, was eventually to control elements of five divisions committed against allied operations in LAMSON 719. On 6 Feb 71, the 1st VC Regt/2d Div was moved east from the Tchepone area to an area northwest of Ban Dong, probably as a blocking force to attempt to control the ARVN ground attack. To the south, the 812th Regt/324B Div was redeployed from the Laotian salient to the vicinity of the hill mass known as the Co Roc, southwest of Khe Sanh. The regiment arrived in early February, probably with the original mission of harassing allied units along Route 9 and acting as a blocking force to limit any allied incursion to the south into BA 611. ARVN elements crossed the SVN-Laotian border in the vicinity of Route 9 on 8 Feb 71 and launched a ground penetration to the vicinity of Ban Dong (objective ALUOI) supported by airmobile assault to the north and south. ARVN elements met little or no resistance during this initial penetration. Enemy reaction however, was immediate. On 11 Feb, the 88th Regt was the first element of the 308th NVA Div to be infiltrated through the DMZ from NVN (Figure A-12). Also on 11 Feb, the 64th Regt/320th Div, later

A-17

CONFIDENTIAL

CONFIDENTIAL

298.



CONFIDENTIAL

FIGURE A-10 (C). Antiaircraft Defense Deployment (U).

299

CONFIDENTIAL

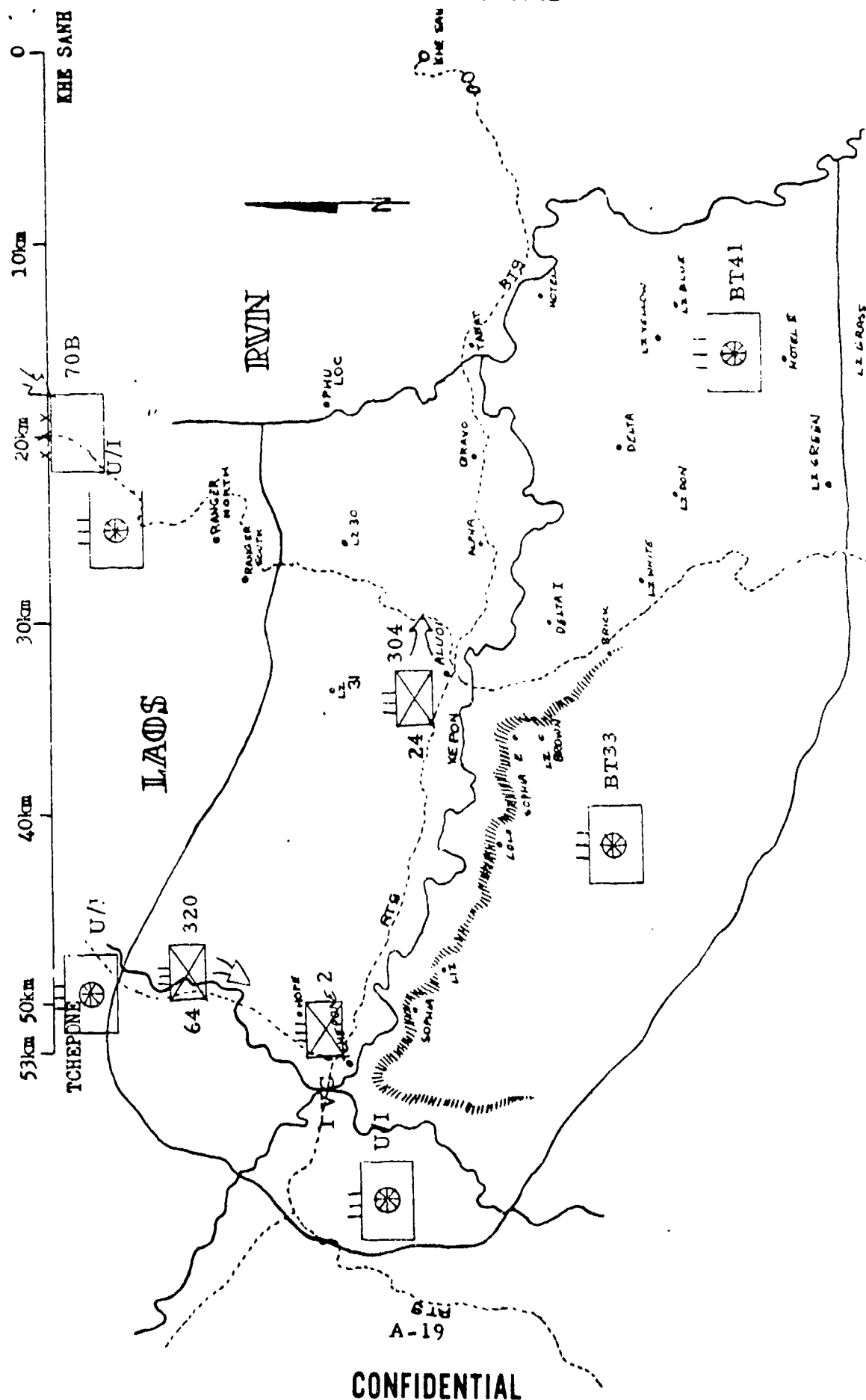


FIGURE A-11 (C) Enemy Disposition, Early February 71 (U).

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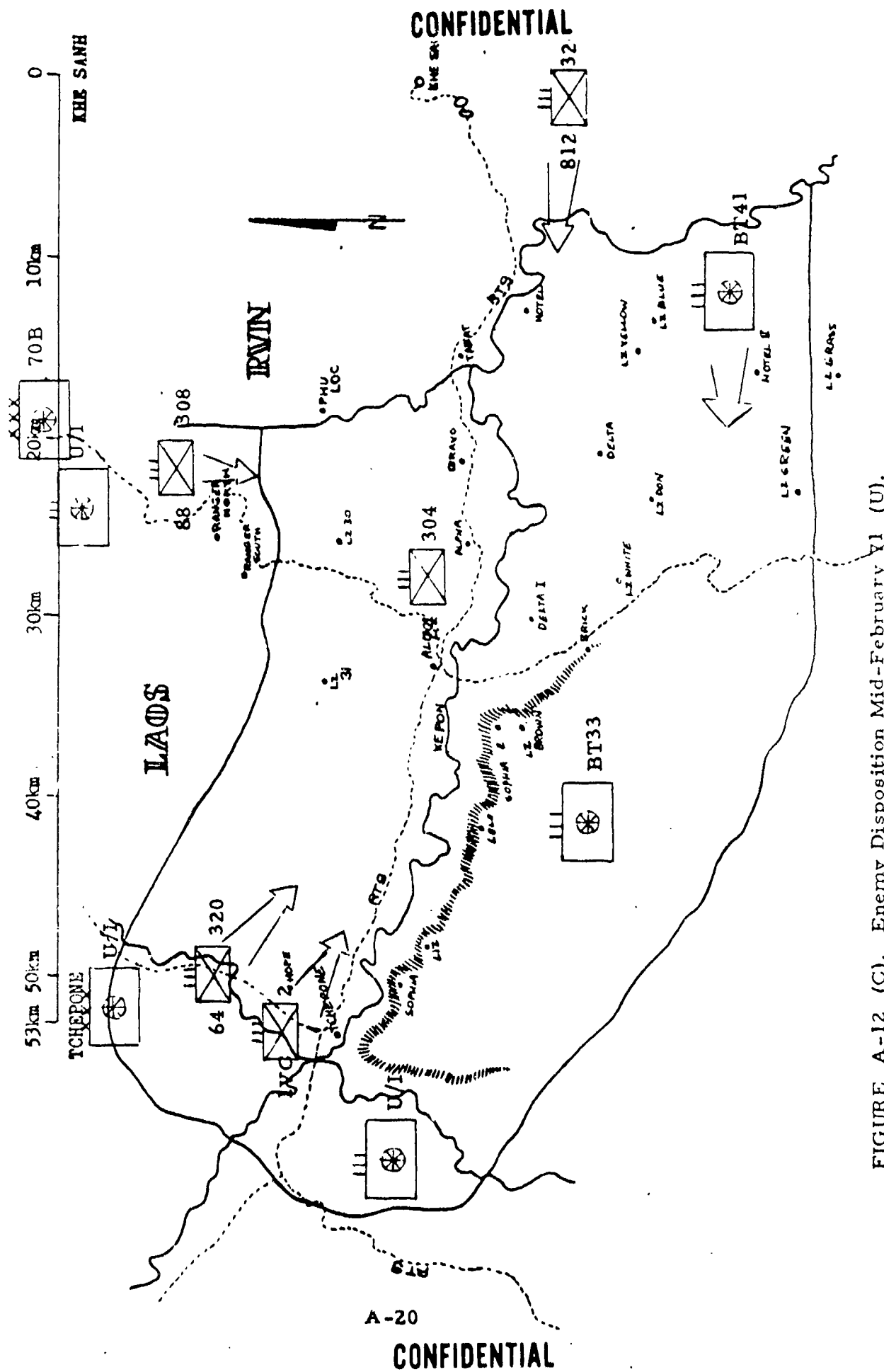


FIGURE A-12 (C). Enemy Disposition Mid-February 71 (U).

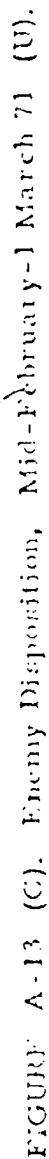
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determined to be originally destined for Cambodia or eastern Laos, received a change of orders and was diverted to the LAMSON 719 area. Following the 88th Regt/308th Div, the remainder of the Div (36th Regt, 102d Regt, and 308th Div HQ) infiltrated south from the DMZ along Route 1032B in mid-February. The Division HQ was located in the western end of the DMZ at this time. To the south, the 29th Regt/324B Div became the second major element of that Div to be committed, and was located in the FB DELTA area. Suspected locations of enemy elements were confirmed beginning on 18 Feb 71 (Figure A-13). The 102d Regt/308th Div was identified as the major force which attacked the 39th ARVN Ranger Battalion in the RANGER NORTH/PANGER SOUTH area. On 24 Feb 71, elements of the 24B Regt/304th Div and the 36th Regt/308th Div, supported by tanks, attacked FB 31. This battle confirmed the infiltration of an unidentified tank regiment to the north of FB 31, probably in mid-February. On 27 February, elements of the 308th Div, employing tanks as fire support, attacked FB 30. In the south, the 324B Div became fully committed to a mission of blocking ARVN incursion into BA 611. The 803d Regt arrived in the southern sector of the area of operations in the vicinity of Route 92d. The Division HQ of 424B Div was located south of the area of operations along Route 922. During the peak of enemy activity in the LAMSON 719 area of operations (early March) it is estimated that the enemy committed approximately 36,000 troops to the area. Binh Tram personnel were committed in a combat role, in addition to the commitment of all available combat arms units (Figure A-14).

b. In early March, ARVN elements, with heavy support from allied air, began a series of airmobile assaults along the escarpment west from Ban Dong reaching the Tchepone area on 6 March. Activity immediately increased in the Tchepone area. During the extraction to the east from the Tchepone area, heavy pressure was brought to bear on ARVN fire bases on the escarpment. These attacks can probably be attributed to elements of the 2d Div, Binh Tram 33, and the 141st Regt. As ARVN elements withdrew to the vicinity of Ban Dong, 2d NVA Div elements followed in close proximity and continued their pressure (Figure A-15). In the east, elements from the 324B and 308th Divisions brought heavy pressure to bear on ARVN forces along Route 9. Heavy attacks by fire were experienced by ARVN fire bases throughout the area of operations. The enemy employed extremely heavy antiaircraft fire along routes to or from ARVN fire bases.

A-21

CONFIDENTIAL



CONFIDENTIAL

<u>UNIT</u>	<u>STRENGTH</u>
70B Front HQ & Support Bns	1500
308th Div HQ & Support Bns	2900
36th Regt	2100
88th Regt	2100
102d Regt	2100
24B Regt/304th Div	1800
64th Regt/320th Div	2000
324B Div HQ & Support	350
803d Regt	1500
29th Regt	1750
812th Regt	1900
2d NVA Div	5000
Pathet Lao	5000
BT 32	2000
BT 33	2000
BT 41	<u>2000</u>
	36,000

FIGURE A-14 (C). Enemy Units Committed Against LAMSON 719,
Early March 1971 (U).

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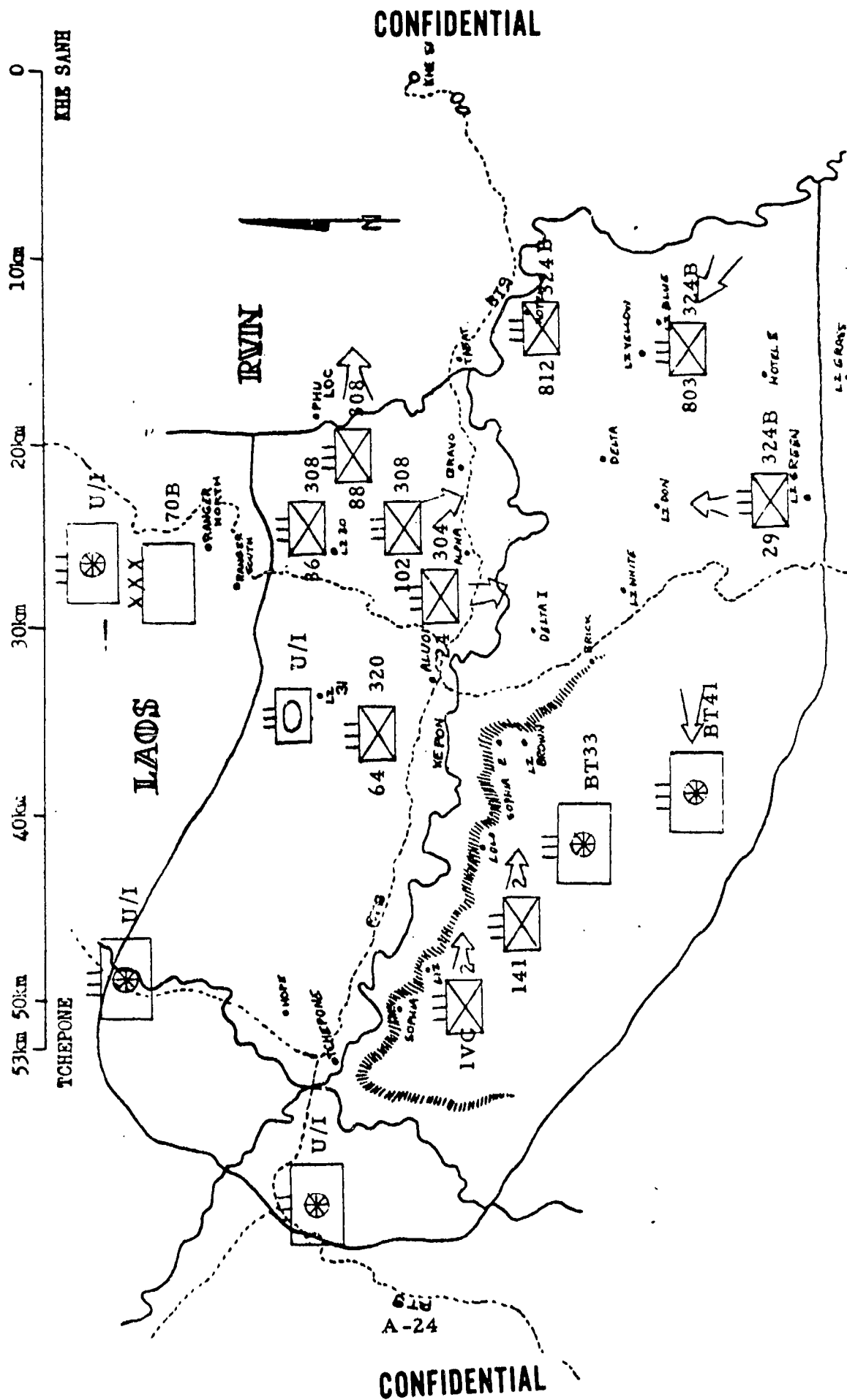


FIGURE A-15 (C). Enemy Disposition, Early March 71 (U).

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305- Mining incidents, attacks by fire, and ground attacks all were directed at ARVN elements along Route 9. During mid-March, the primary US forward support area at Khe Sanh received heavy attacks by fire and a sapper attack. In short, the enemy attempted during the withdrawal to maintain pressure from the west, while hoping to interdict Route 9 between Ban Dong and the Laotian/SVN border. Intense antiaircraft fire was employed in the east in an attempt to render US air support ineffective, and the same motive was behind the heavy attacks by fire at Khe Sanh.

c. Following the ARVN withdrawal, the NVA forces reorganized and assumed a defensive posture protecting the major route structure (Figure A-16).

d. Tactics

Once the enemy was able to react to the initial assault of LAMSON 719, he displayed tactics previously observed elsewhere in Vietnam. However, there were several tactics employed by the enemy during Operation LAMSON 719 which adversely affected allied operations and warrant further discussion.

(1) Ground Forces

The enemy had available a considerably greater fire support capability than previously experienced. He used his artillery to inflict casualties, harass ARVN firebases, and to effectively isolate (in some cases) ARVN firebases from aerial resupply. Knowing that there are certain restrictions regarding the proximity to friendly troops upon employment of B-52's, enemy forces in contact stayed as close as possible to ARVN forces on the ground. This tactic, known for the sake of convenience as "hugging" was seen often during close contacts. The enemy attempted to prevent the employment of B-52's by creating an unacceptable casualty risk to ARVN forces.

(2) Antiaircraft Artillery (Figure A-17)

(a) Instructions given to NVA elements in Laos concerning the employment of antiaircraft weapons against combat assaults by allied forces on helicopter landing zones (LZ) were as follows:

A-25

CONFIDENTIAL

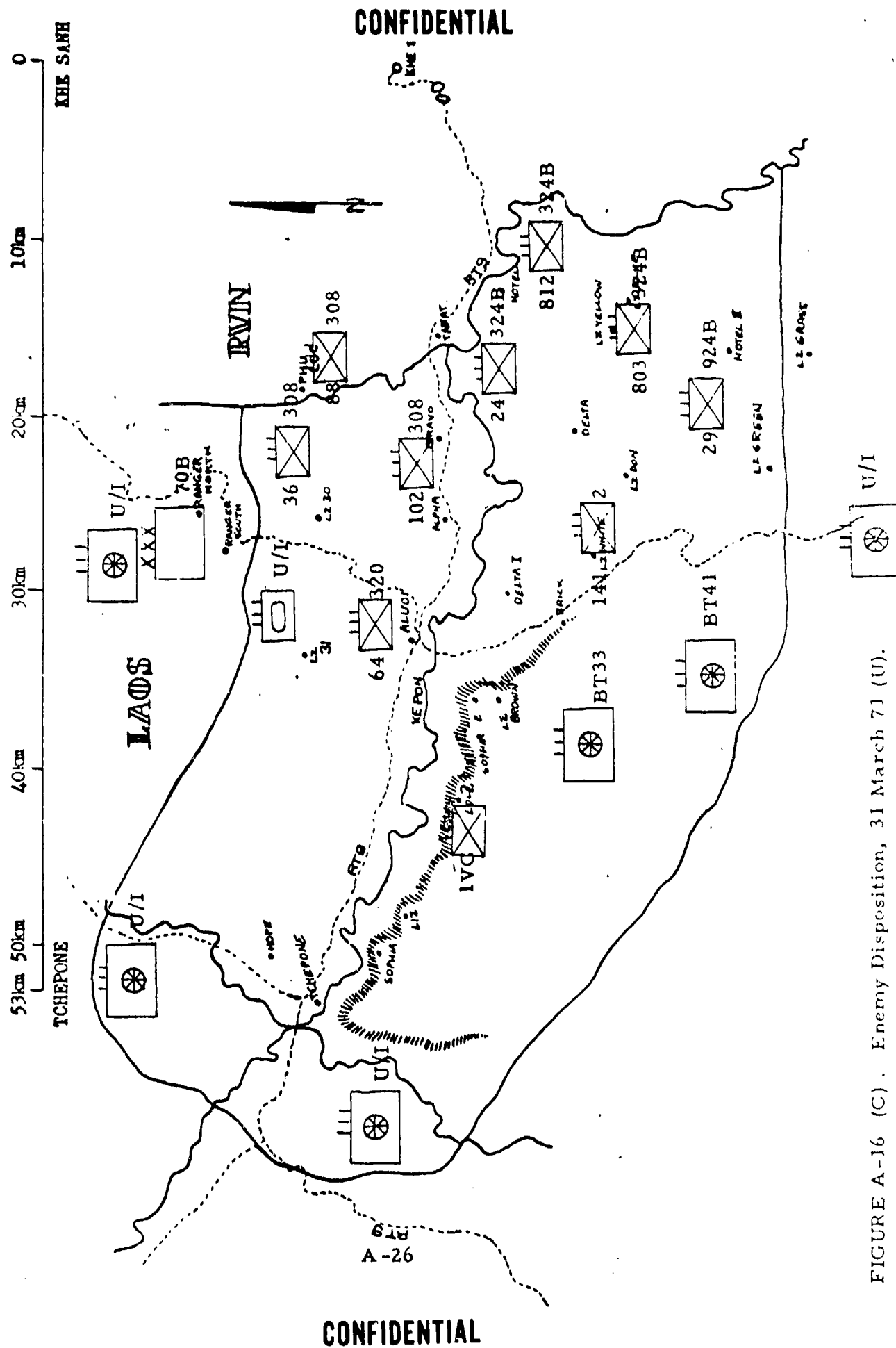


FIGURE A-16 (C). Enemy Disposition, 31 March 71 (U).

<u>CALIBER</u>	<u>RATE OF FIRE</u>	<u>FIRE CONTROL</u>	<u>MAX EFF AA RNG</u>	<u>WEIGHT</u>
12.7mm	80 rpm	Metal sights	1000m	85 lbs
14.5mm	150 rpm	Optical	1400m	650-4600 lbs (Dep on mount)
23mm	200 rpm	Optical Mechanical Computing	2000m	2100 lbs
37mm	80 rpm	Computing sight	1373m	4620 lbs
57mm	70 rpm	Computing sight Radar	400m/6000m	7000 lbs
100mm	15 rpm	Radar	11890m	21,000 lbs

Figure A-17 (U). Characteristics of NVA Antiaircraft Weapons Systems (U)

CONFIDENTIAL

309

1 Make a thorough reconnaissance of areas struck by B-52's and where photo reconnaissance or US aerial surveillance has indicated an interest.

2 Deploy 12.7mm weapons, usually two or three, in the vicinity of a highpoint approximately 1000 meters from a landing zone, engaging helicopters as they land.

3 Reinforce the area around LZ's with 12.7mm weapons, mortars, and artillery during the night after an air assault has been made.

4 Cover air zones extending five to ten kilometers from an LZ with antiaircraft artillery.

(b) Deployment tactics of antiaircraft artillery

1 The 12.7mm weapons were often employed in a triangular or rectangular formation.

2 The 23mm guns were employed in circular, triangular, or rectangular formations. A single gun was, on occasions, utilized to protect storage sites or vital road networks.

3 "Hugging" tactics (ref from IV, B, 1 above) were also employed by antiaircraft units, especially during a heavy contact when confusion and gaps might occur in allied units. Whenever possible, 12.7mm HMG's were employed in the midst of friendly units or very close to friendly lines to engage US helicopter gunships and tactical air supporting the RVNAF in contact. This tactic again exposes allied forces to an unacceptable risk of casualties from gunships or tactical air if the antiaircraft weapon is engaged by either or these means. The enemy made maximum use of this tactic during LAMSON 719.

(c) Redeployment

1 General

Enemy tactical doctrine holds that antiaircraft artillery

CONFIDENTIAL

CONFIDENTIAL

310

weapons will be moved to a new site (predetermined if possible) once their positions have been compromised, either by extensive contact or by friendly surveillance. Captured documents indicate that regardless of compromise of position, AA weapons are redeployed to new sites every six to seven days.

2 Redeployment during LAMSON 719

The extensive enemy threat during the operations was compounded by the fact that AA weapons were continually redeployed. The majority of AA weapons in the operational area were relocated on a daily basis, this making it impossible for allied air support means to maintain accurate deployment data. Redeployment was accomplished while maintaining the same level of coverage, i. e., one position would cover another while redeployment was taking place, redeployment was also accomplished at night.

3 Mobility

Mobility of enemy AA weapons varies from the 85 pound 12.7mm HMG to the medium caliber weapons (23, 37, 57, and 100mm), which weigh from 2,000 to 21,000 pounds. The 12.7mm may be easily moved to new positions by three men. The larger weapons, being mounted on a wheeled carriage, would require a motorized prime mover or a large number of personnel to man-handle them. Roads which would sustain vehicular traffic are necessary for redeployment of the medium caliber weapons. Agent reports from the LAMSON 719 area have described "tanks" with twin-barrelled guns. A quad-barrelled configuration of the 23mm AA automatic weapon is mounted on a light-track chassis which employs many of the components of the PT-76 tank. It is possible that an unknown number of these weapons were employed in the operational area. This weapon would be extremely mobile, and could be resited in a very short period of time, thus maintaining coverage without requirement for a semi-permanent site.

(3) Armor

(a) LAMSON 719 resulted in the third confirmed appearance of NVA armor. The first was the attack against Lang Vei

CONFIDENTIAL

311

Special Forces camp in February 1968. The second was against the Ben Het CIDG camp in the spring of 1969. In both cases, tanks were sacrificed to achieve penetration of the perimeter, while infantry assault followed.

(b). An estimate of the enemy's armor organization and capabilities in Laos indicated that one tank regiment consisting of approximately 40 PT-76 tanks, 40 T-34/T-54 tanks, 40 SU-76 assault guns and 40 BTR APC's were deployed to Vinh, NVA, in October 1970. It is probably that this regiment was organized with three tank battalions of 40 tanks each and a mechanized battalion of 40 armored vehicles. The regiment was apparently directly subordinate to the 70B Front and attached to the infantry forces with which it operated.

(c) Unlike his first two armor engagements, the enemy's deployment of armor during LAMSON 719 was more conventional. The attack on FB 31 was probably a classic example of the way the enemy would like to employ his tanks offensively. As supporting fires were shifted onto the firebase, a coordinated tank/infantry assault was launched. This was followed by a second assault until the position was breached. Though the attack was well-executed, the high cost of tanks will likely prevent repeated use of this tactic. The enemy also used his tanks defensively, blocking ARVN advances along channeled routes, and in a fire support role as at the attack on FB 30.

A-30

CONFIDENTIAL

313

ANNEX B
DOWNED AIRCRAFT RECOVERY

ANNEX D (Downed Aircraft Recovery) to OPORD 1-71. (U)

Reference: Map RVN, 1:100,000, Series L607, Sheets 6342, 6442, 6341, 6441, 6541, and 6641.

1. This annex provides detailed guidance governing the recovery of downed US Army Aircraft assigned or attached to the 101st Avn Gp (AMBL). The ultimate purpose is to provide for the coordinated and timely recovery of any downed aircraft without interfering with the continuation of combat operations. All airmobile operations will include necessary plans for separate recovery operations should the need arise. Aircraft will not be intentionally destroyed unless that is the only means of preventing compromise or capture and then, only with prior approval of a general officer.

2. Recovery of downed aircraft assumes precedence over all non-tactical missions. Tactical missions are defined as combat assaults, artillery moves, missions resulting from enemy contact, or those necessary to assist seriously wounded or injured personnel. The aviation commander in charge of the recovery operation, in coordination with the appropriate ground commander, will determine the urgency of the extraction based on the tactical situation, vulnerability to hostile fire or attack, and the location of the downed aircraft.

3. Aircraft damaged in an accident not attributed to combat action will not be recovered, have parts removed, displaced, or repairs initiated until a written release by the president of the accident investigation board has been obtained. If an accident occurs in a tactically insecure area and expeditious recovery is required, the damaged aircraft may be evacuated to a selected secure area, but no parts will be removed or repairs initiated until a written release has been obtained.

4. Aviation units and direct support detachments will:

- a. Recover disabled unit aircraft, within their lift capability.

ANNEX B

314

b. Establish plans and procedures for the recovery of each type aircraft assigned or attached. Unit recovery plans will include, as a minimum, the following information:

- (1) Personnel assignments and duties
- (2) Requirements for trained maintenance personnel and riggers for all recoveries
- (3) Insure the appropriate recovery equipment listed in Appendix I [omitted] is immediately available.

c. A pilot chute will be used for the recovery of AH-1G and CH-47 aircraft. A pilot chute is not required for recovery of UH-1H and OH-6A aircraft if the tail boom is functional.

- d. Insure that type four link assemblies with spools are utilized.
- e. Insure that all slings are inspected after each recovery by the user.
- f. Request recovery assistance when the load exceeds their capability.

5. The following procedures will be followed:

a. The first unit becoming aware of a downed aircraft will report, with priority precedence, through their higher headquarters to the S-3, 101st Avn Gp. This report should include as a minimum:

- (1) Type of aircraft.
- (2) Location.
- (3) Area (secure or non-secure).
- (4) Owning unit.
- (5) Condition of aircraft, passengers and crew.

- (6) Recovery capability of owning unit (riggers, equipment, etc.).

b. Secured aircraft. The owning unit commander will be responsible for the recovery of his aircraft. He will make the determination when the aircraft will be extracted and to what location. When possible, owning units will provide the recovery team and lift aircraft within its capability. Any required assistance will be coordinated through S-3, 101st Avn Gp.

c. Unsecured aircraft will be recovered by the following procedures:

(1) Upon notification of unsecured downed aircraft the G-3 will designate the recovery commander and based on the current situation provide necessary security elements.

(2) The unit having security responsibility will provide an AMTFC to be collocated with the recovery commander for the purpose of coordinating the recovery operation, suppressive fire, and security force operations. The recovery commander will conduct and control the extraction operation. All communications will be conducted on the security force frequency. Any additional requirements for aviation support will be coordinated through S-3, 101st Avn Gp.

d. Recovery of downed aircraft during conduct of airmobile assaults:

(1) The security and recovery of downed aircraft will be an integral part of all airmobile plans. A recovery commander will be designated by the AMC.

(2) Provisions will be made for multiple recoveries. Aircraft and security personnel will be designated prior to the beginning of the operations.

(3) When a downed aircraft is part of an airmobile force, the mission of the supported unit has priority over rescue and recovery operations.

(4) The air mission commander will provide a maintenance aircraft equipped with sling and rigging equipment for each type aircraft involved in the operation to accompany the airmobile force on all combat assaults. A recovery aircraft will be provided, and will remain on alert status throughout the operation. The air mission commander, in close coordination with the AMTFC, will be responsible for the recovery operations. The AMTFC will provide security and fire support or if this becomes impractical, an ARP may be requested by the AMTFC for security. The AMTFC will designate a 2,000 meter AO around the downed aircraft and the ARP will assume responsibility for the security and extraction operation. All recovery operations will be conducted on the security force net and air to air communications on the recovery force command net.

ANNEX C
AVIATION STATISTICAL SUMMARY

This annex is a statistical summary of required reports maintained during LAMSON 719. The attached data is representative of support rendered by aviation assets as committed to support I CORPS (ARVN) within the LAMSON 719 area of operations. Statistical data herein is representative of the period of 8 FEB 71-24 MAR 71 inclusive.

List of Figures

- C-1. CH-47 Performance Data
- C-2. CH-53 Performance Data
- C-3. CH-54 Performance Data
- C-4. UH-1H Performance Data
- C-5. UH-1C Performance Data
- C-6. AH-1G Performance Data
- C-7. OH-6A Performance Data
- C-8a. Recapitulation of Aircraft Performance, LAMSON 719
- C-8b. Recapitulation of Aircraft Performance, LAMSON 719 plus
Operations in Thua Thien and Quang Tri Provinces
- C-9. Sortie Data (Mission, In Country, Out Country)
- C-10. AH-1G/UH-1C Gunship Statistical Data

ANNEX C

CONFIDENTIAL

3/9

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
8	24	375	315	326	124.1
9	10	56	188	97	31.9
10	16	484	120	323	103.9
11	14	359	82	373	115.5
12	14	405	86	295	109.3
13	18	715	96	454	140.8
14	13	530	110	382	122.3
15	14	487	18	362	115.8
16	15	186	62	194	71.2
17	11	4	-	47	26.6
18	14	457	61	296	103.1
19	10	298	39	243	69.2
20	9	276	41	216	68.1
21	10	215	57	220	61.9
22	10	410	21	261	63.4
23	9	297	10	228	58.3
24	9	324	39	208	58.7
25	10	270	325	208	68.0
26	9	267	89	249	89.0
27	12	286	131	215	79.1
28	12	352	-	274	85.3

FIGURE C-1 (C). CH-47 Performance Data (U).

C-2

CONFIDENTIAL

CONFIDENTIAL

320

March

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
1	12	277	93	233	75.0
2	11	324	83	320	87.5
3	15	210	27	206	63.0
4	17	374	233	302	112.0
5	16	321	359	279	130.0
6	15	408	31	284	104.0
7	13	413	60	288	94.0
8	9	291	204	251	106.0
9	14	101	64	118	38.0
10	12	42	8	55	31.0
11	22	600	74	463	142.0
12	20	442	50	329	135.5
13	16	483	26	407	123.3
14	10	324	94	262	60.8
15	16	213	23	191	58.3
16	15	316	15	278	88.7
17	14	590	3	384	105.4
18	10	395	54	309	86.3
19	14	439	343	362	115.0
20	18	560	422	352	133.0
21	18	331	936	385	124.0
22	14	337	77	244	88.0
23	18	462	1982	467	152.5
24	<u>14</u>	<u>383</u>	<u>1150</u>	<u>394</u>	<u>116.6</u>
TOTALS	616	15689	8301	12534	4135.4

Avg No of Acft/Day: 13.7
 Avg Tons/Day: 348.5
 Avg PAX/Day: 184.4
 Avg Sorties/Day: 278.5
 Avg Hours/Day: 91.9

FIGURE C-1 (C). (Continued) CH-47 Performance Data (U).

C-3

CONFIDENTIAL

321

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
8	6	517	48	277	598.0
9	-	-	-	-	-
10	8	313	15	173	62.2
11	6	343	23	129	46.7
12	-	-	-	-	-
13	4	313	4	137	40.4
14	6	296	6	156	48.1
15	4	256	-	129	29.6
16	6	179	27	100	32.6
17	4	1	101	12	10.5
18	4	209	68	118	23.3
19	6	266	14	131	39.8
20	4	182	92	100	22.1
21	4	198	21	100	25.2
22	2	150	8	85	17.8
23	5	223	44	136	40.4
24	5	91	324	74	28.3
25	4	148	10	87	25.1
26	4	131	15	92	14.9
27	3	46	55	31	12.3
28	4	187	124	122	23.0

FIGURE C-2 (C). CH-53 Performance Data (U).

C-4

CONFIDENTIAL

CONFIDENTIAL

322

March

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
1	3	109	113	67	22.3
2	4	152	62	83	20.0
3	4	86	35	67	21.0
4	6	249	-	156	43.0
5	4	123	40	95	30.0
6	4	170	28	114	32.0
7	4	188	25	134	34.0
8	4	128	11	93	29.0
9	4	7	70	20	10.0
10	4	3	166	20	13.2
11	3	33	70	36	12.4
12	3	12	72	37	18.6
13	3	35	36	39	14.7
14	3	15	25	25	12.2
15	-	-	-	-	-
16	3	23	14	25	12.0
17	1	1	12	5	4.0
18	2	15	59	16	6.7
19	3	1	9	16	9.8
20	4	12	25	27	18.0
21	3	11	5	24	13.8
22	3	-	68	14	11.0
23	-	-	-	-	-
24	-	-	-	-	-
TOTALS	161	5422	1944	3302	982.2

Avg No of Acft/Day: 3.6
 Avg Tons/Day: 120.4
 Avg PAX/Day: 43.2
 Avg Sorties/Day: 73.4
 Avg Hours/Day: 21.8

FIGURE C-2 (C). (Continued) CH-53 Performance Data

C-5

CONFIDENTIAL

323

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
8	5	77	-	34	12.7
9	-	-	-	-	-
10	1	48	-	27	4.4
11	-	-	-	-	-
12	-	-	-	-	-
13	2	-	-	26	9.0
14	2	234	-	96	17.9
15	2	191	-	76	18.7
16	1	52	-	28	4.5
17	1	-	-	2	2.0
18	2	201	-	91	15.0
19	2	167	-	70	14.1
20	2	123	-	57	14.0
21	2	131	-	59	15.0
22	2	68	-	39	10.5
23	2	69	-	34	9.1
24	2	80	-	32	8.5
25	2	42	-	27	7.5
26	2	80	-	39	10.0
27	2	61	-	36	14.0
28	2	104	-	49	17.5

FIGURE C-3 (C). CH-54 Performance Data (U).

C-6

CONFIDENTIAL

CONFIDENTIAL

March

324

<u>DATE</u>	<u>NO OF ACFT</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
1	2	70	-	37	11.7
2	3	125	-	69	27.4
3	2	68	-	38	10.0
4	2	99	-	48	15.0
5	3	78	-	34	12.0
6	3	133	-	50	18.0
7	2	25	-	28	9.0
8	2	47	-	28	8.0
9	1	-	-	7	2.0
10	1	-	-	5	1.5
11	2	90	-	37	10.0
12	2	62	-	35	10.0
13	2	80	-	45	12.6
14	2	61	-	34	10.4
15	-	-	-	-	-
16	2	116	-	50	15.0
17	2	86	-	48	9.5
18	3	155	-	63	18.0
19	2	23	-	14	7.0
20	3	72	-	35	14.0
21	2	56	-	24	7.7
22	2	75	-	36	13.0
23	2	16	-	10	5.5
24	2	81	-	43	14.0
TOTALS	85	3346		1638	465.7

Avg No of Acft/Day: 1.9
 Avg Tons/Day: 74.3
 Avg Sorties/Day: 36.4
 Avg Hours/Day: 10.3

FIGURE C-3 (C). (Continued) CH-54 Performance Data (U).

C-7

CONFIDENTIAL

325

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
8	53	1976	1287	328
9	70	576	830	214
10	94	2622	2374	568
11	74	2449	1924	353
12	98	1748	1920	432
13	77	2688	2117	525
14	83	1653	1725	337
15	93	1790	1804	471
16	97	1759	1711	425
17	54	380	758	148
18	106	1241	1623	550
19	93	1177	1951	560
20	110	1462	1758	618
21	105	1908	1595	455
22	98	2596	1687	514
23	92	2080	1784	452
24	93	1719	1785	471
25	87	1818	1432	379
26	97	3524	2600	570
27	91	2724	2054	471
28	88	2158	1943	470

FIGURE C-4 (C). UH-1H Performance Data (U).

C-8

CONFIDENTIAL

CONFIDENTIAL

326

March

<u>DATE</u>	<u>NO OF ACFT</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
1	85	2404	2218	557
2	63	1673	1507	431
3	93	1403	1389	482
4	50	1231	1050	334
5	96	3007	1986	666
6	133	2120	1465	513
7	65	1346	1363	339
8	72	1543	1604	364
9	57	376	710	230
10	49	479	741	260
11	89	2234	1756	526
12	94	1819	1559	463
13	76	1225	1378	295
14	96	2015	1674	536
15	81	979	1273	326
16	80	1349	1440	350
17	76	1744	1803	485
18	95	2574	2058	654
19	80	1234	1341	365
20	115	2728	1923	608
21	84	2573	1823	408
22	79	1014	1372	392
23	66	3038	1712	513
24	<u>63</u>	<u>3242</u>	<u>1807</u>	<u>390</u>
TOTALS	3790	84003	68733	19981

Avg No of Acft/Day: 84.2
 Avg PAX/Day: 1867
 Avg Sorties/Day: 1527
 Avg Hours/Day: 444

FIGURE C-4 (C). (Continued) UH-1H Performance Data (U).

C-9

CONFIDENTIAL

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>SORTIES</u>	<u>HOURS</u>
8	20	262	142
9	16	77	49
10	16	228	109
11	14	203	80
12	19	360	118
13	17	226	52
14	19	283	110
15	20	224	114
16	18	174	64
17	11	72	35
18	20	151	90
19	17	178	70
20	22	283	101
21	18	227	107
22	22	132	82
23	12	96	53
24	10	88	44
25	12	108	58
26	17	194	78
27	18	206	86
28	14	121	46

FIGURE C-5 (C). UH-1C Performance Data (U).

C-10

CONFIDENTIAL

CONFIDENTIAL

328

March

<u>DATE</u>	<u>NO OF ACFT</u>	<u>SORTIES</u>	<u>HOURS</u>
1	10	104	38
2	12	135	55
3	15	155	49
4	16	214	78
5	12	237	98
6	14	287	73
7	11	144	41
8	13	205	69
9	14	45	58
10	17	44	54
11	17	242	146
12	16	216	104
13	16	186	71
14	18	172	95
15	15	117	66
16	10	235	72
17	14	185	75
18	15	432	92
19	15	158	79
20	14	309	80
21	10	271	63
22	14	145	92
23	13	180	70
24	<u>9</u>	<u>199</u>	<u>68</u>
TOTALS	682	8515	3474

Avg No of Acft/Day: 15.2
 Avg Sorties/Day: 190
 Avg Hours/Day: 77.2

FIGURE C-5 (C). (Continued) UH-1C Performance Data (U).

C-11

CONFIDENTIAL

329

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF ACFT</u>	<u>SORTIES</u>	<u>HOURS</u>
8	34	545	259
9	16	93	48
10	29	193	107
11	27	297	163
12	28	484	176
13	22	294	103
14	24	370	133
15	22	311	128
16	24	351	123
17	15	173	29
18	25	467	171
19	30	452	165
20	30	537	175
21	27	489	150
22	29	503	169
23	20	351	111
24	19	322	110
25	20	335	111
26	22	450	132
27	34	607	202
28	39	523	219

FIGURE C-6 (C). AH-1G Performance Data (U).

C-12

CONFIDENTIAL

CONFIDENTIAL

March

330

<u>DATE</u>	<u>NO OF ACFT</u>	<u>SORTIES</u>	<u>HOUR</u>
1	35	388	163
2	32	455	149
3	44	486	237
4	39	555	273
5	37	392	161
6	38	425	308
7	42	434	226
8	34	323	159
9	14	91	53
10	20	105	84
11	49	499	315
12	45	645	248
13	50	704	291
14	40	378	196
15	41	431	195
16	48	544	289
17	43	464	315
18	57	804	356
19	49	549	262
20	58	584	314
21	48	493	253
22	39	298	168
23	50	585	322
24	<u>40</u>	<u>447</u>	<u>192</u>
TOTALS	1528	19235	8543

Avg No Acft/Day: 33.9
Avg Sorties/Day: 427.4
Avg Hours/Day: 189.8

FIGURE C-6 (C). (Continued) AH-1G Performance Data (U).

G-13

CONFIDENTIAL

CONFIDENTIAL

February

<u>DATE</u>	<u>NO OF AGTS</u>	<u>SOURCES</u>	<u>PAGES</u>
8	19	140	43
9	4	81	20
10	10	140	34
11	13	140	30
12	8	150	31
13	10	123	55
14	12	105	43
15	3	216	15
16	10	154	36
17	1	46	5
18	7	74	27
19	16	89	106
20	12	96	98
21	12	94	78
22	13	95	70
23	10	91	29
24	9	89	31
25	9	78	21
26	11	90	26
27	8	86	23
28	10	124	40

FIGURE C-7 (C). OH-6A Performance Data (U).

CONFIDENTIAL

CONFIDENTIAL

332

March

<u>DATE</u>	<u>NO OF ACFT</u>	<u>SORTIES</u>	<u>HOURS</u>
1	10	124	40
2	5	46	10
3	11	119	42
4	13	153	49
5	8	72	34
6	14	213	61
7	10	147	37
8	9	102	25
9	3	56	6
10	3	112	23
11	6	60	19
12	9	139	43
13	6	120	23
14	9	70	22
15	6	59	15
16	7	78	22
17	7	90	26
18	9	77	22
19	6	64	16
20	10	137	43
21	9	95	26
22	8	60	26
23	9	116	57
24	<u>2</u>	<u>88</u>	<u>20</u>
TOTALS	395	4694	1598

Avg No Acft/Day: 8.8
 Avg Sorties/Day: 104.3
 Avg Hours/Day: 35.5

FIGURE C-7 (C). (Continued) C-6A Performance Data (U).

C-15

CONFIDENTIAL

CONFIDENTIAL

<u>TYPE A/C</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
CH-47	15,689	8,301	12,534	4,135
CH-53	5,422	1,944	3,302	982
CH-54	3,346	-	1,638	466
UH-1H	-	84,003	68,733	19,981
UH-1C	-	-	8,513	3,474
AH-1G	-	-	19,235	8,543
OH-6A	-	-	4,694	1,598
TOTALS	24,457	94,248	118,651	39,179

FIGURE C-8a (U). Recapitulation of Aircraft Performance in Support of LAMSON 719 by 101st Abn Div (Ambl) plus OPCON units (U).

<u>TYPE A/C</u>	<u>TONS</u>	<u>PAX</u>	<u>SORTIES</u>	<u>HOURS</u>
CH-47	27,230	19,608	16,162	7,044
CH-53	5,422	1,944	3,302	982
CH-54	4,499	-	1,854	753
UH-1H	5,581	155,275	122,696	42,626
UH-1C	-	-	8,709	3,799
AH-1G	-	-	23,237	12,953
OH-6A	31	16,688	28,107	10,811
TOTALS	42,763	193,517	204,065	78,968

FIGURE C-8b (C). Recapitulation of Aircraft Performance in Support of LAMSON 719 plus Operations in Thua Thien and Quang Tri Provinces by 101st Abn Div (Ambl) plus OPCON units (U).

CONFIDENTIAL

CONFIDENTIAL

334

DATE	TROOP	LIFT	HELO	GUN	MEDDEVAC	AIR	CAV	LOGISTIC	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	
Feb 8	386	1076	169	333	9	1	15	109	655 50
9	157	-	172	-	1	-	39	-	437 -
10	504	147	56	218	3	3	62	126	596 40
11	456	163	232	122	3	3	30	90	395 133
12	462	249	364	480	-	3	169	375	817 58
13	701	242	213	270	3	1	97	188	1030 192
14	478	280	144	377	12	1	241	234	837 146
15	694	194	375	447	4	-	106	361	888 128
16	482	160	231	293	2	1	135	163	669 74
17	125	-	78	37	-	-	-	-	292 -
18	577	137	230	414	7	7	51	381	583 137
19	756	198	188	414	1	2	148	284	639 142
20	641	183	455	413	4	1	244	269	790 152
21	255	216	316	371	23	5	166	305	873 426
22	381	125	126	463	1	14	97	380	830 195
23	463	339	237	325	2	3	83	282	820 74
24	399	142	170	278	1	4	135	146	813 276
25	450	248	177	248	10	1	90	172	567 99
26	490	283	136	419	1	10	128	292	935 294
27	504	146	261	495	-	1	93	308	874 120
28	584	113	271	396	-	-	167	184	1079 113

FIGURE C-9 (C). Sortie Data (U).

C-17

CONFIDENTIAL

335

CONFIDENTIAL

DATE	TROOP	LIFT	HELO	GUN	MEDEVAC	AIR	CAV	LOGISTIC
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Mar 1	305	556	230	303	5	1	187	184
2	542	495	240	449	-	-	187	187
3	444	265	279	503	2	2	254	120
4	1012	477	294	514	2	3	217	129
5	905	758	283	478	10	-	252	138
6	753	1021	272	518	17	2	138	156
7	940	119	354	301	-	-	136	90
8	451	202	195	333	4	5	133	75
9	110	-	35	42	-	12	-	12
10	28	63	59	66	-	-	-	-
11	708	343	181	508	4	12	23	-
12	617	312	302	593	-	17	155	103
13	481	164	237	571	-	2	138	110
14	337	229	169	457	26	33	169	99
15	280	92	172	370	-	5	113	89
16	523	114	307	431	-	-	139	56
17	737	178	304	331	9	16	215	93
18	756	576	390	846	3	-	86	100
19	542	181	230	456	8	22	167	75
20	1015	282	284	1104	-	1	141	55
21	976	459	331	457	2	-	216	70
22	300	80	256	187	-	-	119	50
23	752	274	359	397	3	10	119	51
24	810	362	470	233	-	4	106	51
TOTALS	23769	12243	10534	17267	182	208	5696	6742

FIGURE C-9 (C). (Continued) Sortie Data (U).

CONFIDENTIAL

CONFIDENTIAL

330

February

DATE	UH-1C HELICOPTER SORTIES				AH-1J HELICOPTER SORTIES				AH-1G AIR CAV SORTIES				AH-1G ARA SORTIES			
	NO OF ACFT		IN		NO OF ACFT		IN		NO OF ACFT		IN		NO OF ACFT		IN	
	OUT	HRS	OUT	HRS	OUT	HRS	OUT	HRS	OUT	HRS	OUT	HRS	OUT	HRS	OUT	HRS
Feb 8	20	142	10	153	385	100	52	153	11	52	52	41	13	108	83	65
9	16	49	10	34	68	10	-	24	-	-	-	-	6	28	28	14
10	16	109	4	35	70	50	46	30	13	46	30	32	12	80	60	40
11	14	80	4	35	76	50	130	120	15	130	120	83	8	91	-	45
12	19	118	4	32	62	62	258	222	11	258	222	57	13	164	134	87
13	17	52	4	36	72	72	127	103	5	127	103	22	13	95	83	50
14	19	110	4	21	42	42	196	177	9	196	177	46	11	132	94	66
15	20	114	4	36	70	46	117	110	6	117	110	31	12	124	74	61
16	18	64	4	23	46	46	182	126	8	182	126	40	12	123	75	60
17	11	35	4	3	4	-	-	-	-	-	-	-	11	111	27	26
18	20	90	4	27	54	54	254	201	13	254	201	67	12	159	149	77
19	17	70	4	22	44	44	253	240	14	253	240	71	12	150	123	72
20	22	101	4	24	46	46	352	195	15	352	195	82	11	139	90	69
21	18	107	4	20	40	40	317	220	12	317	220	65	11	132	132	65
22	22	82	4	26	52	52	324	279	12	324	279	78	12	130	130	65
23	12	53	4	32	64	64	216	188	8	216	188	47	8	71	2	32
24	10	44	4	29	58	58	177	92	6	177	92	37	9	87	67	44
25	12	58	4	25	48	46	143	104	5	143	104	22	11	144	144	64
26	17	78	4	37	72	72	299	238	11	299	238	54	7	79	70	41
27	18	86	16	96	188	170	305	260	9	305	260	51	9	114	19	55
28	14	46	20	127	222	207	185	122	7	185	122	34	12	116	70	58

FIGURE C-10 (U). AH-1G/UH-1C Statistical Data (U).

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March

DATE	NO OF ACFT	UH-1C HELICOPTER SORTIES		HRS	NO OF ACFT	AH-1G HELICOPTER SORTIES		HRS	NO OF ACFT	AH-1G AIR CAV SORTIES		HRS	NO OF ACFT	AH-1G ARA SORTIES		HRS
		IN	OUT			IN	OUT			IN	OUT			IN	OUT	
Mar 1	10	104	48	38	16	199	168	90	7	108	30	38	12	81	81	40
2	12	135	51	55	16	177	171	78	8	173	112	33	8	105	105	38
3	15	155	60	49	26	231	202	124	8	113	72	45	12	142	100	68
4	16	214	121	78	22	298	255	178	7	113	51	38	12	144	113	57
5	12	237	159	98	21	196	153	107	6	113	52	35	10	83	83	39
6	14	287	182	73	25	213	146	129	5	117	48	32	8	95	90	47
7	11	144	89	25	16	180	104	101	17	172	93	81	9	82	74	44
8	13	205	128	69	12	102	85	58	14	182	96	82	8	39	35	19
9	14	45	-	58	6	42	42	24	2	4	-	6	6	45	45	23
10	17	44	12	54	6	67	63	56	3	12	8	15	7	26	26	13
11	17	242	180	146	14	135	118	135	20	268	172	138	9	96	81	42
12	16	216	158	204	14	217	170	90	23	356	226	123	8	72	72	35
13	16	186	97	71	20	257	313	140	19	275	177	116	9	72	26	35
14	18	172	128	95	14	106	98	80	16	164	77	63	10	108	101	53
15	15	117	123	65	16	159	151	91	15	175	100	63	10	87	82	41
16	10	235	55	72	16	211	199	89	25	299	177	182	7	36	36	18
17	14	185	115	75	12	114	84	90	24	285	126	193	7	65	56	32
18	15	432	280	92	24	405	365	172	26	325	230	127	7	74	74	37
19	15	158	110	79	20	204	195	113	20	267	168	110	9	78	76	39
20	14	309	161	80	24	280	272	158	26	242	136	128	8	62	54	28
21	10	271	130	63	14	141	141	87	24	283	117	146	10	69	65	20
22	14	145	64	92	10	78	28	44	20	160	81	103	9	60	34	21
23	13	121	90	70	16	240	118	111	26	287	162	172	8	58	50	29
24	9	192	55	68	14	183	61	68	18	214	98	101	8	50	30	23
TOTALS	682	8560	3675	3474	526	6318	5025	3286	572	8663	5659	3150	436	4205	3243	1997

FIGURE C-10 (C). (Continued) AH-1G/UH-1C Statistical Data (U).

C-20

CONFIDENTIAL

CONFIDENTIAL

338

ANNEX D
SUMMARY OF COMBAT DAMAGE

1. Explanation of columns contained in Appendices 1 through 7.
 - A. Julian Date
 - B. Unit identification code (UIC)
 - C. Final three digits of aircraft serial number
 - D. Damage code (USARV Regulation 95-10)
 - A. Incident damage
 - B. Minor damage
 - C. Major damage
 - Lost (destroyed); indicated by a vacant space
 - E. Location in six digits (grid zone designator is XD in all cases)
 - F. Cause of damage/loss code (USARV Regulation 95-10)
 - AAA Antiaircraft artillery (over 23mm)
 - ART Artillery
 - GDE Grenade and RPG
 - GNH Ground fire 12.7 and 14.5mm
 - GNL Ground fire less than 12.7mm
 - MIF Missing in flight
 - MTR Mortar
 - RKT Rocket
 - SCH Satchel charge
 - UNK Unknown
 - G. Local time of day

ANNEX D

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Explanation of columns contained in Appendices 1 through 7 (continued)

H. Flight phase code (USARV Regulation 95-10)

EH Enroute high (1500 feet above the terrain or higher)
EL Enroute low (less than 1500 feet above the terrain)
HO Hovering
LD Landing
OG On ground in LZ or PZ
OR Orbiting
OT Other
PK Parked in an unprotected location
TA Target attack
TO Take off
TW Target withdrawal
UN Unknown

I. Altitude in feet above the terrain when aircraft was hit

J. Airspeed in knots when aircraft was hit

K. Number of hits; UN if unknown

L. Responsible system (USARV Regulation 95-10)

AR Armament
AT Anti-torque
CT Controls
CU Casualties
DS Driveshaft
EL Electric
EN Engine
EO Engine oil
FF Fire in flight
FU Fuel
GB Gearbox
HD Hydraulics
MR Main Rotor
NA Not applicable

D-2

CONFIDENTIAL

CONFIDENTIAL

342

L. Responsible system (USARV Regulation 95-10) (continued)

OT Other
TR Transmission
UN Unknown
XO Transmission Oil

An asterisk (*), when shown, indicates damage sustained outside Laos, yet considered as within the operational environment for statistical purposes.

2. List of Appendices

Appendix 1 - OH-6A, OH-6AA
Appendix 2 - AH-1G
Appendix 3 - UH-1C
Appendix 4 - UH-1H
Appendix 5 - CH-47
Appendix 6 - CH-53, CH-54
Appendix 7 - UIC Codes and Unit Designations

D-3

CONFIDENTIAL

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OH-6A

A	B	C	D	E	F	G	H	I	J	K	L
1039	ABOA	775	C	728240	GNL	1050	EL	0050	020	01	MR
1039	AZNC	083	A	595416	GNL	1440	EL	0025	030	01	MR
1041	ABOA	483		650289	GNH	1115	RF	0050	100	02	CT
1041	AZNC	083	A	521398	GNL	1125	EL	0025	030	01	MR
1041	AZNC	339	A	515405	GNL	1210	EL	0025	020	01	MR
1042	AZNC	117	A	432416	GNL	1402	EL	0050	030	05	OT
1043	AZNC	216	A	544381	GNL	0900	EL	0050	100	02	OT
1043	AZNC	579	A	490405	GNH	1530	EL	0050	100	01	MR
1044	ACJA	636	A	378279	GNL	1345	EL	0000	090	03	NA
1044	ABOC	390	C	671477	GNH	1445	EL	0050	070	02	EL*
1045	GZ6B	187	B	501358	GNH	1225	EL	0025	070	01	EN
1045	ABOC	997	C	618498	GNL	1330	EL	0050	060	02	EN
1045	GZ6B	779	B	468277	GNL	1500	EL	0050	070	01	NA
1045	ABOC	195	B	612500	GNH	1630	EL	0300	105	01	NA
1046	ABOC	528	A	565365	GNH	1250	EH	2000	100	05	MR
1046	GZ6B	341	B	465295	GNL	1330	TA	0020	080	01	MR
1046	AZNC	027	B	475406	GNH	1430	EL	0050	100	06	CT
1046	GZ6B	779	A	503356	GNL	1520	EL	0050	085	01	NA
1046	ABOC	528	A	693505	GNH	1530	EH	1800	100	03	MR*
1046	ABOC	195	B	612500	GNH	1630	EL	0300	105	10	MR
1050	GZ6B	207	B	575086	GNL	1020	EL	0030	080	01	MR
1050	ABOC	528		465415	GNH	1640	EL	0050	080	UN	UN
1051	AZNC	141	B	536438	GNL	1215	EL	0050	080	01	MR
1052	GZ6B	054	B	673196	GNH	1610	RF	0050	060	01	NA
1054	GZ6B	187	B	628163	GNL	1340	RF	0030	070	04	NA

Appendix 1 (OH-6A) to Annex D (Summary of Combat Damage)

CONFIDENTIAL

CONFIDENTIAL

GH-6A (cont)

1055	GZ6B	054	A	727264	GNH	1500	EL	0020	060	01	NA
1055	GZ6B	341	A	718212	GNL	1530	EL	0020	040	01	NA
1056	GZ6B	881	A	723266	GML	1400	EL	0020	060	01	NA
1056	GZ6B	298		723266	GNL	1600	RF	0010	060	07	EN
1057	GZ6B	630		727214	AAA	1305	RF	UN	ULK	UN	UL
1057	GZ6B	054		668319	GDE	1400	RF	0100	105	01	EN
1058	GZ6B	256		625208	GNH	1540	RF	UN	ULK	UN	UN
1059	AEBC	195	C	548430	GNH	1230	EL	0050	075	05	OT
1076	AZNC	339	A	845419	ART	1845	OG	0000	000	01	NA*

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AH-1G

A	B	C	D	E	F	G	H	I	J	K	L
1039	AB3D	348	A	497584	GNL	1000	TA	0200	070	03	TR
1039	AB3D	572	A	497582	GNL	1000	UN	0175	060	01	NA
1039	AZNC	019	A	580403	GNL	1210	EL	0140	140	01	OT
1039	ABOA	168	A	705232	GNL	1400	TA	0150	110	01	MR
1039	FJ8A	025	A	593435	GNL	1730	TA	0400	110	03	OT
1040	AB3D	106		901433	GNL	1615	EL	0200	080	25	UN
1041	ABOA	102		655285	GNL	1115	TA	0050	130	04	TR
1041	ABOA	693	A	655285	GNL	1120	TA	0200	120	03	MR
1041	AZNC	019	A	515405	GNL	1210	TA	0100	110	01	MR
1041	AZNC	047	A	493410	GNL	1250	TA	0100	120	02	MR
1041	AZNC	822	A	493410	GNL	1250	TA	0100	120	02	MR
1041	FJ8B	848		566363	GNH	1530	TA	0600	130	UN	FF
1041	AZNC	832	C	553404	GNL	1620	TA	0050	100	07	MR
1041	FJ8A	059		593369	GNH	1715	CR	UN	UNK	UN	FF
1042	ABOA	743	B	692245	GNL	0905	TA	0300	120	01	MR
1042	AZNC	431	A	432416	GNH	1402	TA	0100	080	01	AR
1043	AZNC	479	A	564398	GNL	0910	EL	0100	100	01	NA
1043	AZNC	076	A	568402	GNH	0915	TA	1500	120	01	MR
1043	AZNC	807	A	424462	GNH	0930	TA	0100	100	02	NA
1043	ABOC	089		641490	GNH	1120	TA	UN	UNK	UN	UN
1043	ABOC	456	A	667483	GNH	1130	OR	0250	120	01	MR*
1043	ABOC	745	A	650482	GNH	1145	EL	0150	100	01	MR
1043	ABOC	755		641502	GNH	1305	EL	UN	UNK	UN	UN
1043	ABOC	137	A	645505	GNL	1310	EL	0300	100	01	MR
1043	AZNC	487	A	432416	GNH	1340	TA	0100	080	01	NA
1044	AZNC	076	A	485436	GNL	0905	EL	0500	120	01	EX
1044	AZNC	327	C	469412	GNH	1115	TA	0500	120	01	HD
1044	FJ8C	700	B	483516	GNL	1130	TW	1000	110	02	DS
1044	ABOA	108	C	962270	GNL	1715	EL	0200	120	01	FU*
1044	FJ8B	736	A	515500	GNL	1715	TA	0800	110	01	NA
1044	FJ8C	710	B	515490	GNL	1815	TA	1000	120	07	CU
1045	ABOA	099	B	585287	GNH	1300	TA	0200	140	01	OT
1045	FJ8C	030	A	621229	GNL	1600	TA	1000	120	01	OT

Appendix 2 (AH-1G) to Annex D (Summary of Combat Damage)

CONFIDENTIAL

CONFIDENTIAL

344

AH-1G (cont)

1045	ABOC	745	A	560530	GNH	1615	EH	3000	100	03	FU
1046	AZNC	822	A	482400	GNH	1046	TA	0020	100	01	OT
1046	AZNC	832	B	482400	GNH	1046	TA	0020	100	05	HD
1046	FJ8B	055	A	613430	GML	1630	TA	1000	130	01	OT
1047	FJ8B	055	A	690160	GNH	1420	TA	1000	130	01	OT
1047	FJ8A	025	A	732174	GNH	1645	TA	1000	110	01	AR
1049	AZNC	076	B	858384	GML	1120	CG	0000	000	03	OT*
1049	ABOA	698		470348	GML	1200	TA	0200	100	UN	UN
1049	FJ4D	042	C	594505	GNH	1210	TA	1000	140	02	EL
1049	AZNC	822	B	528598	GML	1330	EL	0050	100	03	HD
1049	FJ8B	260	B	570330	GML	1530	TA	0600	135	02	NA
1049	ABOA	099	B	566252	GML	1620	EL	0800	110	01	MR
1049	ABOA	679	B	566252	GML	1620	EL	0800	110	01	MR
1050	FJ8B	702	B	593505	GNH	1045	TA	1000	140	04	OT
1050	FJ8B	200	A	595512	GNH	1445	OR	1500	095	01	OT
1050	FJ8C	129	B	506471	GNH	1600	OR	1000	100	04	EL
1051	AZNC	807	C	524486	GML	1230	TA	0100	110	04	CT
1051	FJ8B	260	B	595518	GNH	1410	TA	0860	150	01	CT
1051	FJ8A	654	A	575507	GNH	1510	TA	1000	150	01	CT
1051	ABOA	168	B	600239	GML	1830	TA	0020	080	03	EL
1051	AZNC	076	B	591594	GNH	1730	EL	0200	110	02	EN
1052	GZ6B	344	B	650270	GNH	1420	TA	1200	100	01	NA
1052	GZ6B	827	B	547306	GML	1420	EL	0100	090	01	AR
1052	ABOA	099	B	566252	GML	1620	EL	0800	110	01	MR
1052	FJ8C	167	B	519461	GNH	1625	TA	2000	130	03	EL
1052	ABOA	093	C	595226	GNH	1720	EH	3500	120	05	OT
1053	FJ8B	055	A	591227	GNH	1155	OR	1800	070	01	MR
1053	GZ6B	478	B	547306	GNH	1330	TA	1000	080	02	NA
1054	FJ8C	058	A	523472	GNH	1020	TA	2000	140	01	AR
1054	FJ4D	844	B	590450	GNH	1120	TW	3000	140	01	CT
1054	FJ8B	702	A	500472	GNH	1450	TA	2000	100	02	CT
1055	FJ8C	030	A	665265	GNH	1330	OR	3500	100	01	OT

Page 2 of Appendix 2 to Annex D

CONFIDENTIAL

CONFIDENTIAL

AH-1G (cont)

1055	GE6B	827	B	709207	GML	1500	TA	3000	100	03	EN
1055	FJ8B	744	C	600230	GNH	1700	TA	1500	140	06	EN
1056	FJ4D	599	A	505471	GML	1500	TA	1500	140	01	MR
1056	AZNC	076	C	510470	GNH	1545	TA	0225	130	13	MR
1056	AZNC	822	B	510470	GML	1545	TA	0025	130	05	MR
1056	AZNC	832	E	549485	GML	1545	TA	0050	130	02	NA
1057	FJ8A	017	A	650250	GNH	1100	TA	2000	120	01	MR
1057	FJ8A	794	A	650250	GNH	1100	TA	2000	120	02	MR
1057	ABOC	749	C	345375	GNH	1115	EL	1200	110	02	EL*
1057	FJ8C	030	A	620270	GNH	1600	TA	1500	120	02	MR
1057	ABOA	757	C	507471	GNH	1630	EL	0200	110	11	OT
1058	FJ8C	151	B	630270	GNH	1100	TA	2000	100	01	OT
1058	ABOA	480	A	632130	GNH	1525	TA	0200	120	01	OT
1058	FJ8C	710	A	620260	GML	1550	TA	0015	120	01	CT
1058	FJ4D	093	B	598459	GML	1600	EH	2500	100	03	EN
1058	FJ4D	120		505471	GML	1600	EL	1000	100	06	FC
1058	ABOA	572	C	625265	GNH	1730	TA	0300	130	02	CT
1059	ABOA	743	B	563237	GML	1750	EH	5000	120	03	CT
1060	AB3D	737	E	557437	GNH	1030	TA	1000	100	01	CT
1060	ABOA	697	C	477325	GNH	1110	EL	1000	110	02	CT
1060	ABOA	348	A	436209	GNH	1145	TA	0200	110	01	CT
1060	ABOA	108	C	477325	GNH	1430	EL	1000	110	02	HD
1060	FJ8A	759	A	523475	GML	1845	TA	2500	120	01	CT
1061	DX6A	854	E	580500	GNH	1100	TA	0100	120	01	NA
1061	DX6A	855	E	580500	GNH	1100	TA	0100	120	01	NA
1062	FJ4D	577	A	354540	GNH	1300	TA	2500	120	03	NA
1062	FJ8B	310	A	600400	GML	1600	TA	2000	110	02	HD
1063	DX6A	780		578315	RKT	1520	TA	0050	100	01	UL
1064	AAVD	727	B	648391	GML	1100	TN	1000	140	03	EN
1064	AAVD	548	C	491412	GML	1500	OR	1000	130	07	EN

CONFIDENTIAL

CONFIDENTIAL

346

AR-10 (cont)

1065	AZNC	832		527495	GNL	0335	TA	0500	080	UN	TR
1065	FJBA	153		532391	MTR	0500	OG	0000	000	UN	CT
1065	FJBA	018		532391	MTR	1300	OG	0000	000	UN	CT
1065	AAVD	031	A	595391	GNL	1000	EL	1000	130	01	NA
1065	ABCA	743	B	474405	GNL	1000	TA	0050	120	01	CT
1065	ABCA	700	C	672535	GNL	1000	OR	3000	100	01	CT
1065	ABCA	480	B	464398	GNL	1010	TA	2000	110	01	CT
1065	ABCC	137	B	473415	GNL	1030	EL	0050	120	01	CT
1065	ABCC	745	B	473415	GNL	1030	EL	0050	110	06	NR
1066	ABCA	023	A	635382	GNL	1300	EH	2000	080	01	NA
1066	ABCA	033	C	472416	GNL	1245	EL	1000	120	04	NR
1066	AAVD	740	C	595390	GNL	1045	EL	1000	130	03	NA
1066	ABCC	749	A	655387	GNL	1720	EL	0600	140	04	CT
1067	ABCA	697	C	659442	GNL	0845	EL	1400	120	07	CT
1067	FJBB	230	A	595395	GNL	1245	OR	2000	100	01	CT
1067	FJBB	703	B	595395	GNL	1245	TA	2000	150	01	CT
1068	FJLD	079	A	585382	GNL	1600	TW	0900	090	01	AR
1068	AAVD	034	C	650398	GNL	1600	EL	1200	120	05	AT
1070	ABCA	656	B	431371	GNL	1015	EH	3000	150	03	NA
1070	FJBC	720	A	625270	GNL	1030	TA	1300	120	01	CT
1070	FJBC	805	B	436356	GNL	1900	TA	3500	130	01	CT
1073	FJBB	260	B	423362	GNL	1145	TA	1500	140	01	CT
1073	FJBB	595	B	431362	GNL	1250	TA	0500	120	01	CT
1073	ABCA	465	B	413100	GNL	1315	TA	0200	090	02	CT
1073	FJBB	524	B	584402	GNL	1735	TA	1500	150	01	CT
1074	FJBA	073		432372	MTR	1000	OG	0000	000	01	CT
1074	ABCA	108	B	947418	MTR	1715	OG	0000	000	UN	NA*
1074	FJBA	337		432372	GNL	1000	OR	1000	100	UN	HD
1074	ABCA	687	A	840420	RKT	1800	OG	0000	000	01	NR*
1074	FJBA	185	B	425367	GNL	1830	OR	0000	100	01	FU
1075	ABCA	057	B	482363	GNL	1530	EH	2000	120	02	CT
1075	FJBB	595	A	430370	GNL	1600	TA	1500	130	01	NR
1075	ABCC	432	B	844200	RKT	1705	OG	0000	000	02	CT*
1075	ABCC	748	B	844200	RKT	1705	OG	0000	000	01	CT*

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AH-1G (cont)

1076	FJ8C	793	B	448378	GNH	1520	OR	0800	110	04	FF
1076	FJ8A	564	B	448367	GNH	1545	TA	0800	110	02	CT
1076	AE0A	465	B	433381	GNH	1800	TA	0800	120	02	CT
1076	FJ4D	577	A	974605	GML	1810	TA	1000	140	01	OT*
1077	AE0A	743		439405	GML	1305	TA	0800	100	UN	UN
1077	AE3D	077		469392	GML	1530	TA	1000	120	UN	ED
1077	AAVD	031	A	575405	GNH	1730	EH	2500	100	01	MR
1078	FJ4D	452	B	552415	GNH	1130	TA	1000	120	02	MR
1078	FJ4D	599	E	552415	GNH	1130	TA	1000	120	01	MR
1079	FJ8A	066	A	850418	MTR	0826	CG	0000	000	01	OT*
1079	AE3D	787	A	510355	GNH	1300	TA	2500	130	01	NA
1079	FJ4D	774	B	540420	AAA	1530	OR	5050	110	01	CT
1079	FJ4D	093	A	615380	GML	1630	OR	1000	130	01	MR
1079	FJ4D	079	A	537413	GML	1745	TA	0030	050	02	CT
1079	FJ4D	831	C	537413	GNH	1745	OR	0100	080	04	LC
1080	AZNC	019		626356	GNH	1315	EH	2000	140	UN	UN
1080	AB0A	108	B	530350	GML	1330	EL	0900	100	01	MR
1080	AB0A	748	B	844180	GML	1400	EL	0004	010	01	MR*
1082	FJ8A	150		850418	RET	0345	CG	0000	000	01	NA*
1082	FJ8A	017	C	850418	SCH	0415	CG	0000	000	01	UN*
1082	FJ8A	025	C	850418	SCH	0415	CG	0000	000	01	UN*
1082	FJ8A	564	C	850418	SCH	0415	CG	0000	000	01	UN*
1082	AZNC	144	A	646360	GML	1630	TA	0050	100	01	NA

CONFIDENTIAL

CONFIDENTIAL

348

UH-1C

A	B	C	D	E	F	G	H	I	J	K	L
1037	C38A	742	A	725285	GNL	1400	TA	0100	030	02	AR
1040	FJ3A	145	A	555502	GNL	1600	TW	1500	100	01	NA
1041	C42A	170	C	917567	GNL	1100	TA	0400	070	05	CU*
1042	C42A	507	B	905569	GNL	1100	TA	1300	030	01	NA*
1042	C41A	180	A	610270	GNL	1400	TW	0200	100	02	NA
1042	C41A	442	A	610270	GNL	1450	TW	0200	070	01	NA
1043	C41A	176	B	550340	GNL	1200	TA	0100	030	01	EN
1043	C38A	097	A	505505	GNL	1620	TA	0300	070	01	NA
1043	C38A	649	A	505505	GNL	1650	TA	0300	070	02	NA
1044	DX9A	206	A	563497	GNL	1115	TA	0500	080	03	NA
1044	DX9A	531	A	563497	GNL	1115	TA	0500	080	02	NA
1044	C41A	536	B	550340	GNL	1200	TA	1200	100	08	NA
1045	C38A	649	A	710220	GNL	1145	TA	0100	080	01	NA
1046	C38A	520	A	735225	GNL	1615	TA	0150	030	01	NA
1046	C38A	097	A	630160	GNL	1630	TA	0100	080	01	NA
1047	C38A	460	A	583267	GNL	1645	TA	0100	080	01	NA
1049	C38A	712	B	715737	GNL	1100	TA	0500	090	05	NA*
1049	C38A	742	C	599173	GNL	1300	TW	0100	080	16	FU
1049	C38A	460	B	690230	GNL	1345	TA	0200	085	03	NA
1049	DX9A	636	A	570490	GNL	1600	TA	1000	070	01	NA
1051	C38A	712	C	500200	GNL	1100	TA	0050	100	17	MR
1051	C38A	545	C	562198	GNL	1215	TA	0075	080	10	EL
1051	C38A	700		562198	GNL	1215	TA	UN	UN	UN	UN
1052	C42A	161		575286	GNL	1215	EL	0600	080	UN	CU
1053	C42A	507	A	445545	GNL	1600	TA	0800	070	01	MR
1055	C42A	470	C	575287	GNL	1430	EL	0075	080	03	CT
1055	C38A	520	B	705235	GNL	1430	TA	1000	095	02	NA
1055	DX9A	146	A	484402	GNL	1630	TA	0500	080	01	NA

Appendix 3 (UH-1C) to Annex D (Summary of Combat Damage)

CONFIDENTIAL

349

CONFIDENTIAL

TH-10 (cont)

1057	ARTA	678	A	380410	GNL	1600	EL	0350	090	C1	CT
1057	041A	176	B	403620	GNL	1730	TA	1000	090	06	NA
1059	03BA	097	A	663203	GNE	1330	TA	0050	090	02	NA
1059	041A	531	A	720210	GNE	1415	TA	2000	085	02	NA
1062	03BA	520	B	371385	GNE	1000	TA	0200	030	03	NA
1062	03BA	097	B	431372	GNE	1015	TA	0050	090	04	NA
1062	03BA	649	C	425409	GNE	1015	EH	2500	030	01	CT
1062	042A	170		610380	GNE	1650	FL	0020	030	03	TR
1062	042A	092		610380	GNE	1650	EL	0900	090	01	CU
1063	042A	540	B	680290	GNE	1530	EL	0800	090	01	CU
1064	03BA	687	B	350430	GNE	1300	TA	2000	085	04	NA
1064	ARTA	050	A	505395	GNE	1400	EL	0050	090	01	UN
1064	ARTA	492		505395	GNE	1400	EL	0050	090	UN	UN
1064	042A	094		510400	GNE	1445	TA	0025	090	UN	FC
1064	042A	169		510400	GNE	1445	TA	0020	050	UN	CT
1065	DX9A	132	A	670380	GNE	0800	EL	0500	080	01	NA
1065	DX9A	203	A	670380	GNE	0800	EL	0500	080	01	NA
1065	03BA	520	A	346430	GNE	1345	TA	0500	030	01	NA
1065	DX9A	042		497368	GNE	1800	EH	2000	090	UN	EH
1066	ARTA	510	B	507394	GNE	1600	EH	1500	090	05	NA
1070	03TA	097		495356	GNE	1330	TA	0100	080	UN	UN
1070	03BA	460	B	493349	GNE	1430	TA	0500	080	06	NA
1070	03BA	712	B	493449	GNE	1600	TA	0100	090	01	NA
1073	03BA	489	A	507337	GNE	1100	TA	0100	070	01	NA
1073	ARTA	117	B	648268	GNE	1600	EH	3000	050	01	MR
1074	041A	070	A	425378	GNE	1400	TX	0700	010	01	FF
1074	041A	536	F	425378	GNE	1515	TA	0500	010	05	FC
1074	03BA	545	B	433372	GNE	1520	TA	0200	010	02	MR
1077	ARTA	128	B	726347	GNE	1000	EH	3000	010	01	MR
1077	ARTA	510	B	726347	GNE	1000	EH	1600	010	01	MR
1077	042A	190	A	495365	GNE	1315	EL	0300	080	03	CT
1077	DX9A	734	A	482401	AAA	1500	TA	0300	030	01	NA
1077	042A	513	A	495365	GNE	1630	TA	3500	090	01	TR

Page 2 of Appendix 3 to Annex D

CONFIDENTIAL

CONFIDENTIAL

350

UH-1C (cont)

1078	C3EA	489		585428	UNK	1415	TA	UN	UN	UN	UN
1078	C3EA	743	B	585428	GNL	1415	TA	0300	090	04	NA
1082	DX9A	146		850418	SCH	0345	CG	0000	000	01	NA*
1082	DX9A	206		850418	SCH	0345	CG	00	000	01	NA*
1082	C42A	190	A	875445	GNL	1115	TA	3500	090	01	MR*

Page 3 of Appendix 3 to Annex D

CONFIDENTIAL

CONFIDENTIAL

UH-1H

A	B	C	D	E	F	G	H	I	J	K	L
1037	041A	663		725205	GNL	1515	HL	1500	0000	UN	UN
1037	041A	661	C	725285	GNL	1515	HL	0000	0000	10	TH
1037	038A	478	C	725285	GNL	1515	HL	0003	0000	04	TH
1039	041A	587		725285	GNL	1515	HL	1000	0000	UN	EN
1039	042A	671	C	725247	GNL	1515	HL	0000	0000	TH	OT
1039	041A	307		590377	GNL	1440	HL	3200	0000	UN	UN
1039	041A	369	C	720270	NTR	1500	HO	0003	0000	UN	OT
1039	038A	232	A	725285	GNL	1515	HO	0003	0000	01	OT
1039	038A	445	A	725285	NTR	1515	HO	0003	0000	01	OT
1041	038A	199	A	650285	GNL	1115	HL	0050	0000	01	NA
1041	038A	165	C	529309	GNL	1115	HL	1500	0000	01	EN
1041	038A	398	A	493410	GNL	1015	HL	0050	1000	02	OT
1041	038A	141	A	647371	GNL	1430	HL	0010	0000	01	NA
1041	041A	405	A	647371	GNL	1515	HL	1025	0000	01	NA
1041	038A	400	C	718757	GNL	1515	HL	0050	0000	15	EN
1042	042A	359	B	917571	GNH	0015	HL	0050	0000	02	NA
1042	042A	730	B	917571	GNH	0015	HL	0150	0000	03	AT
1042	042A	889	A	610271	GNH	1445	HL	0300	0000	01	OT
1042	038A	206	A	601071	GNL	1500	HL	0000	0000	01	NA
1042	038A	847	A	610271	GNH	1515	HL	0100	0000	04	NA
1042	038A	413	A	610271	GNL	1600	HL	0020	0000	02	NA
1042	042A	062	A	597370	GNL	1615	HL	2000	0000	01	NA
1043	041A	234	A	604857	GNL	1015	HL	1200	0000	01	EN
1043	038A	205	A	551344	GNL	1100	HL	1000	0000	03	NA
1044	038A	101	A	475475	NTR	1145	HL	0006	0000	10	NA
1044	041A	125	C	473474	GNH	1115	HL	0010	0000	05	OT
1044	038A	016	B	475475	NTR	1145	HL	0003	0000	08	NA
1044	038A	337	B	475475	NTR	1145	HL	0000	0000	06	NA
1045	041A	715	C	500495	NTR	1030	HL	0000	0000	01	NA
1045	041A	439		514459	NTR	1630	HL	0003	0000	02	OT
1046	065A	617	B	927545	GNL	1500	HL	0150	0000	01	NA
1046	042A	191	B	928482	GNL	1530	HL	0150	0000	01	OT*
1046	042A	423	C	925425	GNL	1530	HL	0010	0000	03	OT*
1046	038A	345	B	630160	GNL	1630	HL	0000	0000	02	NA

Appendix 4 (UH-1H) to Annex D (Summary of Combat Damage)

CONFIDENTIAL

CONFIDENTIAL

352

UH-1A (cont)

1047	0000	586	A	672485	GHL	1730	EL	1300	090	01	NA
1048	0000	340	C	540545	GHL	1330	EL	0000	090	05	PU*
1049	0000	413	A	103415	GHL	1145	EL	1000	090	01	NA
1049	0000	000	B	905505	GHL	1245	LD	0000	090	01	OT*
1049	0000	508	A	531515	GHL	1330	EH	3000	120	02	NA
1049	0000	450	C	591515	MTR	1530	LD	0000	090	01	OT
1049	0000	013		545515	MTR	1545	CG	0000	090	03	NA
1049	0000	706	C	585515	GHL	1545	EL	0200	110	10	TR
1050	0000	341	A	574251	GHL	1620	EL	1000	090	01	NA
1050	0000	218		813567	RXT	1930	CG	0000	090	01	OT*
1051	0000	413	B	540240	GHL	1145	EL	0500	090	02	NA
1051	0000	000		574502	GHL	1430	EL	0100	110	10	TR
1051	0000	493	C	575502	GHL	1500	EL	0100	090	01	LD
1051	0000	672	C	582505	GHL	1100	EL	1050	110	05	PU
1051	0000	233	A	574502	GHL	1130	EL	0050	080	02	NA
1051	0000	891	B	592335	MTR	1130	EL	0000	090	01	NA
1052	0000	744	C	574500	GHL	1130	EL	0050	100	15	PU
1052	0000	118	B	910540	GHL	1730	TO	0000	080	03	NA*
1053	0000	598	B	644494	GHL	1845	CG	0000	090	01	NA
1054	0000	414	A	606215	GHL	1030	LD	0000	090	01	NA
1054	0000	132	A	606195	GHL	1530	EH	1500	090	01	NA
1054	0000	413	C	504352	GHL	1530	EH	3500	090	02	NA
1054	0000	000		640210	GHL	1615	EH	3200	070	01	NA
1055	0000	775	B	596478	MTR	1045	LD	0000	010	02	NA
1055	0000	221	A	636195	GHL	1530	EH	1500	090	01	NA
1055	0000	259	B	690210	MTR	1600	TO	0000	005	01	NA
1056	0000	383		585472	AAA	1030	LD	0000	090	01	PU
1056	0000	186	A	573503	GHL	1040	EL	1100	080	01	OT
1056	0000	401		600450	MTR	1310	CG	0000	090	10	TR
1056	0000	327	B	523466	GHL	1545	LD	0075	120	03	EN
1056	0000	671	B	938572	GHL	1615	LD	0050	095	01	MTR

Page 2 of Appendix 4 to Annex D

CONFIDENTIAL

CONFIDENTIAL

IN-1H (cont)

1056	C42A	403		934585	GNL	1630	TO	0025	010	UN	OT*
1056	C3EA	879	B	676235	GNL	1630	LD	0400	030	04	NA
1056	C3EA	016	B	678235	GNL	1640	LD	0100	020	07	OT
1057	FJ4C	611	A	573503	GNH	0925	TO	0005	010	01	TR
1057	FJ4C	661	A	573508	GNH	1015	TO	0100	030	01	NA
1057	FJ4C	186	A	583503	GNL	1440	TO	0075	050	01	MR
1057	FJ4C	186	A	584373	GNH	1440	TO	0075	050	01	MR
1057	C3EA	332	B	660205	GNH	1725	LD	0050	050	06	NA
1057	C3EA	443	B	660205	GNH	1730	LD	0050	010	06	NA
1057	AZNC	453	A	510420	GNL	1810	EL	0050	110	02	NA
1058	FJ4C	661	B	602445	GNL	1500	TO	0300	060	02	NA
1058	G76P	708	B	625208	GNH	1525	LD	0100	015	10	FU
1058	DLKA	678	B	624221	GNH	1530	EH	2000	080	01	NA
1058	FJ4C	773	B	599348	GNL	1615	TO	0200	040	01	NA
1058	FJ4A	554	A	512443	GNL	1630	EL	0050	110	01	MR
1058	FJ4C	775	B	599348	GNL	1645	TO	0200	060	01	NA
1059	FJ4C	341	F	602445	GNL	0930	EL	0600	090	01	NA
1059	FJ4C	775	B	602445	GNL	1030	EL	0300	090	01	NA
1059	C3EA	276		663206	MTR	1330	LD	0003	010	01	TR
1059	C3EA	206	B	663206	GNL	1335	LD	0500	090	10	NA
1059	C3EA	949	A	487348	GNL	1630	LD	0300	066	02	NA
1060	AB3A	557	A	557437	GNH	1000	TO	0500	080	03	OT
1060	AB3A	049	A	557437	GNL	1000	TO	0500	080	01	OT
1060	FJ4A	637	A	543420	GNL	1230	EL	0070	100	02	FU
1060	FJ4A	598	A	543420	GNH	1615	EH	1600	100	01	FU
1060	FJ4A	554	A	550455	GNH	1630	EL	1000	095	01	MR
1061	AB3A	497	B	506470	GNL	1030	EL	0030	060	01	NA
1061	BM2A	717	C	533423	GNH	1645	EH	3300	090	02	OT
1061	AB3A	264	B	505460	GNL	1700	EL	0050	080	08	FU
1061	AB3A	956	E	505460	GNL	1700	EL	0030	010	01	NA
1062	C42A	053	A	432373	GNL	0615	EL	0010	020	01	ON
1062	C3EA	177		650299	GNH	0955	EH	2000	080	01	FU
1062	AB3A	495	B	431372	GNL	1000	LD	0050	060	05	NA
1062	AB3A	511	C	431372	GNL	1000	HO	0003	000	04	NA
1062	AB3A	641	C	431370	GNL	1000	LD	0005	000	01	NA
1062	AB3A	189		431372	GNL	1015	LD	0050	030	10	FU

CONFIDENTIAL

CONFIDENTIAL

354

(cont.)

1062	AB3A	220		431372	GNL	1030	LD	0100	080	15	OT
1062	AB3A	252	B	431372	GNL	1100	LD	0150	080	08	NA
1062	ART4	383	B	431371	GNL	1100	LD	0030	010	06	TR
1062	ART4	426	B	431371	GNL	1100	LD	0030	010	03	FU
1062	ART4	496	A	431371	MTR	1100	LD	0010	010	04	NA
1062	ART4	357	A	431371	GNL	1100	LD	0020	010	05	NA
1062	ART4	358		431371	MTR	1100	LD	0030	010	UN	OT
1062	ART4	376	A	431371	GNL	1100	LD	0040	020	05	NA
1062	ART4	568	A	431371	AAA	1100	LD	0050	015	02	NA
1062	ART4	761	A	431371	GNL	1100	LD	0030	015	02	NA
1062	ART4	826	A	431371	GNL	1100	LD	0020	005	02	NA
1062	ART4	269		431371	GNL	1100	HO	0030	010	UN	OT
1062	AB3A	049	B	431372	GNL	1130	LD	0150	090	08	OT
1062	FJ4B	279		538349	ART	1327	LD	0030	025	01	FF
1062	AB3A	350	B	431372	GNL	1400	LD	0300	060	05	NA
1062	ACFT	226	A	405307	GNH	1430	LD	0100	030	01	MR
1062	AB3A	103	A	440378	GNL	1500	LD	0015	050	02	NA
1062	C41A	695	A	420360	ART	1500	OG	0000	000	01	NA
1062	C41A	689	A	420370	MTR	1530	OG	0000	000	01	NA
1062	AB3C	735	B	410387	GNL	1530	TO	0100	040	06	NA
1062	C42A	671	B	432373	GNL	1530	LD	0050	020	05	MR
1062	FJ4B	455	B	538349	GNL	1530	EL	0040	040	02	NA
1062	FJ4B	425	B	538349	ART	1535	LD	0005	010	01	NA
1062	FJ4B	326	B	538349	GNL	1540	LD	0020	015	02	NA
1062	FJ4B	894	B	538349	GNL	1542	EL	0100	050	01	NA
1062	FJ4B	812	B	538349	GNL	1544	EL	0100	045	02	NA
1062	AB3B	341	B	410387	GNL	1600	EL	0050	080	01	NA
1062	C3EA	388	B	431372	GNH	1600	LD	0050	060	02	NA
1062	ACFT	667	A	UNK	GNH	1600	LD	0200	060	06	MR
1062	C42A	639		588388	GNH	1615	LD	UN	UNK	UN	UN
1062	C42A	953	A	432373	GNL	1615	EL	0010	020	01	EN
1062	C42A	533	B	432373	GNL	1630	LD	0050	020	02	NA
1062	C42A	191	A	505402	GNL	1635	LD	0020	050	01	MR
1062	AB3A	900	B	431372	GNL	1700	LD	0200	045	07	FU
1062	AB3A	268	B	431372	GNL	1700	LD	0200	080	02	NA
1063	FJ4A	174	A	553415	GNL	1115	EL	0060	080	03	EL
1063	FJ4A	175	A	553415	GNL	1115	EL	0060	080	03	EL
1063	C41A	666	A	370390	GNL	1530	LD	0050	020	01	NA
1063	C3EA	386	A	375399	GNL	1610	TO	0050	060	02	NA
1063	FJ4C	602	B	315415	GNL	1630	LD	0050	060	07	FF
1063	FJ4C	462		315415	GNL	1635	LD	0250	060	UN	EN
1063	FJ4C	736	B	315415	GNL	1640	LD	0100	060	02	FF
1063	AB3A	557	B	440378	GNL	1700	TO	0200	080	02	FU
1063	C3EA	223	A	375399	GNL	1700	LD	0010	020	01	NA

CONFIDENTIAL

355

CONFIDENTIAL

UH-1H (cont.)

1063	FJ4B	662	B	353403	GNL	1715	TO	0100	050	01	MR
1063	FJ4B	889	B	355403	GNL	1716	TO	0050	040	03	OT
1063	FJ4B	894		353403	GNL	1717	TC	0020	020	30	HD
1063	FJ4B	578	B	355403	GNL	1718	HO	0001	000	25	EN
1063	FJ4B	446	B	353403	GNL	1720	TO	0010	010	02	EN
1063	C3EA	141		600380	GDE	1730	HO	0002	000	01	EN
1064	C42A	676	A	339408	GNL	1245	LD	0100	080	01	OT
1064	C42A	191	A	339408	GNH	1330	LD	0200	080	01	MR
1064	C3EA	079	B	320420	GNH	1330	LD	0250	080	01	CT
1064	C3EA	446	A	338411	GNL	1330	LD	1000	090	01	NA
1064	FJ4C	899	B	364408	GNL	1400	LD	0300	090	01	EN
1064	C3EA	388	C	335470	GNL	1400	EH	2000	080	02	CT
1064	C42A	215		348408	GNH	1415	LD	0050	060	UN	OT
1064	C41A	435	B	335415	GNH	1430	LD	0500	090	01	NA
1064	AB3B	495	B	484415	GNL	1430	TO	0300	100	06	EN
1064	FJ4C	341		364408	GNL	1430	LD	0050	060	UN	UN
1064	C3EA	879	B	346408	GNL	1430	LD	0500	080	01	NA
1064	C42A	783		451411	GNH	1445	LD	0050	020	UN	UN
1064	FJ4C	640	A	570505	GNL	1515	EL	0500	080	UN	MR
1064	EAEA	706	B	625292	GNL	1815	EL	1000	100	02	OT
1065	FJGA	529	C	330430	GNH	1200	EH	3000	085	20	CT
1065	C43A	958	B	455413	GNL	1300	LD	1000	100	09	OT
1065	C3EA	295	B	346430	GNH	1315	EH	2500	100	02	NA
1065	ARTA	491	B	347957	GNL	1400	TO	0500	070	02	FU
1065	AB3C	833	C	797362	GNH	1600	EH	1500	080	01	CT
1065	C3EA	378	A	360540	GNL	1700	EH	1500	060	01	NA
1065	C41A	383	B	430370	GNL	1700	TO	0500	060	01	NA
1065	C3EA	358	A	378380	GNL	1715	TO	0700	090	02	NA
1065	FJ4C	186	B	478409	GNL	1730	LD	0005	000	03	OT
1065	ABOA	662	B	478409	GNL	1745	OR	0100	090	02	OT
1065	ABOA	533	B	478409	GNL	1745	EL	0050	100	01	OT
1065	FJ4C	484	B	478409	GNL	1800	TO	0025	030	02	OT
1065	ABOA	155	B	471416	GNL	1800	EL	0300	100	03	OT
1065	AZNC	453	A	510400	GNH	1810	LD	0050	100	02	NA
1065	AZNC	703	A	510400	GNH	1810	LD	0050	100	01	NA
1065	AZNC	290	A	510400	GNH	1810	LD	0050	100	01	NA
1065	FJ4C	493	B	478409	GNL	1815	LD	0020	010	UN	FU
1066	D65A	624	B	673383	GNL	0645	EL	0300	050	02	OT
1066	FJ4A	891	C	585405	GNL	1130	EL	0050	100	06	OT
1066	FJ4A	396	A	585405	GNL	1525	EL	0050	100	05	MR
1066	FJ4A	660	B	665395	GNL	1540	EL	0010	110	08	HD

Page 5 of Appendix 4 to Annex D

CONFIDENTIAL

CONFIDENTIAL

356

UH-1H (cont)

1067	ABOC	165	B	652388	GNL	0810	EL	0010	100	01	OT
1067	AB3A	350		630267	GNL	1500	LD	0040	070	UN	UN
1067	ABOA	155	B	471416	GNL	1800	EL	0300	100	03	OT
1068	D65A	624	B	656387	GNL	1400	EL	0600	100	02	OT
1068	BM2A	249		348402	MTR	1500	OG	0000	000	01	XO
1069	FJ4A	616		532376	GNH	1800	LD	0200	070	UN	AT
1069	C42A	695		701403	GNH	1845	LD	0020	020	UN	OT *
1070	ABOC	429	A	650400	GNL	1146	EH	1800	100	01	OT
1070	FJ4A	606	B	390430	MTR	1400	HO	0005	000	01	OT
1070	FJ4A	566	C	390432	GNL	1400	HO	0005	000	10	OT
1070	AB3C	980	A	385395	GNL	1400	EH	5000	080	01	NA
1070	C41A	382		490350	GNL	1430	EH	2500	100	UN	CT
1070	C41A	346	B	500350	MTR	1600	OG	0000	000	02	NA
1070	C3EA	206		502357	GNL	1630	LD	0050	035	05	EN
1070	C42A	763	B	627288	GNL	1730	LD	1000	060	02	OT
1071	C3EA	079	C	580240	GNH	1130	EH	1500	060	02	OT
1071	AB3B	303	A	495335	GNL	1600	LD	0050	085	01	CT
1071	AB3B	630	A	460360	GNL	1630	EL	0500	080	02	CT
1071	FJ4A	606	B	410370	GNH	1700	EL	0600	065	01	DS
1071	FJ4A	640	B	410370	GNH	1700	EL	0600	065	01	DS
1072	AB3B	438	B	683437	GNL	1000	TO	1000	080	01	OT *
1072	C42A	540	A	635273	GNH	1130	EH	3500	090	01	CT
1072	D65A	617	B	615255	GNL	1130	EL	0700	100	01	FU
1072	FJ4C	258	B	535412	GNL	1145	EL	0020	090	01	FU
1072	EAEA	147	B	447367	GNH	1230	EL	0900	110	01	MR
1072	AB6A	104	C	968589	GNL	1700	LD	0003	000	04	OT *
1073	C42A	667	A	683275	GNL	1300	LD	1000	080	04	OT
1073	C41A	689	A	440370	GNH	1400	TO	0500	080	01	NA
1073	C3EA	446	A	443375	GNH	1530	EH	2800	060	01	NA
1073	D65A	216	A	731371	MTR	1600	TO	0030	070	01	OT *
1073	EAEA	247	C	640381	GNH	1600	EL	0200	100	15	EN
1074	ABOC	429	B	652387	GNH	1100	EL	0900	100	01	OT
1074	C3EA	386	B	438362	GNH	1410	TO	0300	070	03	NA
1074	C3EA	949	A	438368	GNH	1420	EH	1500	080	02	MR
1074	C3EA	446	A	434372	GNH	1420	TO	0300	050	01	NA
1074	C3EA	259	A	440378	GNH	1500	TO	0800	070	01	NA
1074	C3EA	221	A	433372	GNH	1520	TO	0500	085	01	NA

CONFIDENTIAL

CONFIDENTIAL

357

UH-1H (cont)

1075	FJ4A	175	B	656385	GNH	0800	TO	0025	110	01	MR	
1075	C3EA	345		480370	GNH	1315	LD	0200	060	10	OT	
1075	C3EA	388	B	480370	GHL	1315	LD	0100	060	10	NA	
1075	ABOC	216	C	640465	GNH	1400	EL	1200	110	10	OT	
1075	D65A	216	B	504358	MTR	1600	NO	0010	000	01	OT	
1075	ABOC	199		844200	MTR	1700	OG	0000	000	UN	OT	*
1075	ABOC	700	B	844200	RKT	1705	OG	0000	000	01	OT	*
1075	ABOC	429	B	844200	RKT	1705	OG	0000	000	01	OT	*
1076	C41A	155	B	462373	GNH	1015	TO	0700	070	03	OT	
1076	C42A	516	A	673485	GNH	1016	EH	2000	090	01	OT	*
1076	C41A	385	A	468382	GNH	1045	TO	0100	030	01	NA	
1076	D64A	656	B	640330	MTR	1550	OG	0000	000	01	OT	
1076	ARTA	491	B	645295	GNH	1600	OG	0000	000	01	OT	
1076	C41A	689	B	465390	GNH	1700	LD	0300	080	02	NA	
1076	FJ4A	946	B	556401	GHL	1730	EL	0050	120	01	OT	
1076	AZNC	489	A	845419	ART	1945	OG	0000	000	02	NA	*
1077	AZNC	328	C	845419	ART	0630	OG	0000	000	01	EN	*
1077	C3EA	378	A	507385	MTR	0730	HO	0005	000	01	NA	
1077	EAEA	364	C	570430	GNH	1215	EL	0050	040	10	MR	
1077	ABOA	519	B	439405	GHL	1310	EL	0100	060	02	OT	
1077	ARTA	770	B	726347	GNH	1425	EL	0200	110	04	MR	*
1077	AB3C	192	B	345410	MTR	1500	LD	0002	000	01	NA	
1077	C41A	088		642387	GDE	1515	HO	0010	000	UN	EN	
1077	C3EA	187	A	453384	GNH	1530	HO	0015	000	01	CT	
1077	FJ4A	376	B	515392	GHL	1720	EL	0100	090	01	MR	
1077	ARTA	742	B	726347	MTR	1820	OG	0000	000	01	OT	*
1078	FJ4A	396	B	584426	GHL	1015	LD	0010	010	02	MR	
1078	FJ4A	370	B	584426	GHL	1030	EL	0015	090	01	CT	
1078	FJ4A	597	B	589413	GHL	1030	EL	0050	110	02	OT	
1078	FJ4A	472	B	585425	GNH	1030	EL	0010	080	03	OT	
1078	FJ4A	174	B	585425	GNH	1035	EL	0010	110	02	OT	
1078	ABOC	215	B	440382	GNH	1100	EH	1500	110	01	OT	
1078	C41A	689	A	585432	GHL	1200	LD	0050	050	01	NA	
1078	C41A	828		585428	MTR	1200	LD	0030	040	01	TR	
1078	C41A	130		585435	MTR	1230	LD	0050	030	01	CT	
1078	ABOC	155	B	668505	GNH	1230	EH	4000	100	01	OT	*
1078	C41A	385	A	585435	GHL	1230	LD	0060	080	01	NA	
1078	C41A	643	B	580420	GHL	1245	LD	0020	030	08	EN	
1078	C42A	191	B	733371	GNH	1300	LD	1000	075	01	OT	*
1078	FJ4A	598	B	585424	GNH	1400	EL	0020	060	05	OT	
1078	FJ4A	678	B	584426	GHL	1440	HO	0005	000	04	EN	

CONFIDENTIAL

CONFIDENTIAL

358

UHL-1H (cont)

1078	FJ4A	566	C	564389	GML	1530	HL	0025	100	04	OT
1078	D65A	216	C	516340	GML	1800	EL	0050	113	03	PU
1078	FJ4C	602	C	582389	GML	1830	TO	0025	100	06	EN
1078	FJ4C	389		582389	GML	1830	HO	0003	000	UN	EN
1079	C3EA	085	B	515343	GML	0745	TO	0010	050	04	EA
1079	C41A	155	C	520390	GML	1130	TO	0030	010	05	EN
1079	C42A	458	B	515352	GML	1130	LD	0020	000	09	MR
1079	C41A	669	A	513353	GML	1130	LD	0060	010	03	EA
1079	C41A	024	C	510250	GML	1145	LD	0030	005	01	EN
1079	C3EA	223	B	515343	GML	1145	LD	0010	020	02	EA
1079	C3EA	776	C	515343	GML	1145	LD	0000	040	04	EN
1079	C3EA	238		580240	GML	1150	LD	0050	050	02	EN
1079	C3EA	764	B	515352	GML	1150	LD	0050	040	06	EA
1079	C3EA	016	A	513359	GML	1200	LD	0050	090	02	EA
1079	C42A	340	A	551342	GML	1200	OG	0000	000	01	OT
1079	AB3B	341	B	515352	GML	1200	TO	0200	060	02	NA
1079	AB3A	501	B	515352	GML	1200	TO	0300	070	05	EA
1079	AB3B	505		515352	GML	1200	TO	0300	060	12	EN
1079	C42A	953	B	517358	GML	1200	LD	0050	030	04	MR
1079	AB3B	337	B	515352	GML	1200	TO	0400	080	40	EA
1079	C3EA	446	A	515352	GML	1200	LD	0100	060	01	EA
1079	AB3C	746	C	515352	GML	1215	EL	0500	060	10	UN
1079	AB3C	819	B	515352	GML	1215	LD	0100	110	04	EA
1079	C42A	667	B	517358	GML	1215	LD	0500	020	10	OT
1079	C42A	676	B	513364	GML	1220	LD	0300	010	16	MR
1079	AB3A	630	B	515352	GML	1230	TO	0300	060	12	EN
1079	C42A	223	A	515352	GML	1230	LD	0500	080	01	TR
1079	AB3A	492		515352	GML	1230	LD	0050	090	75	OT
1079	C42A	284	B	517358	GML	1300	LD	0250	080	10	OT
1079	C42A	654		511348	GML	1300	LD	0050	050	30	EN
1079	C42A	359	C	515355	GML	1315	LD	0010	010	12	OT
1079	ACFT	226	C	500340	GML	1400	TO	0050	030	05	MR
1079	EAEA	230	C	505345	GML	1420	EL	0010	020	04	TR
1079	C41A	352	B	850418	MTR	1430	OG	0000	000	04	EA *
1079	D65A	623	C	847418	MTR	1430	HO	0003	000	03	MR *
1079	AB3A	185		515352	GML	1500	LD	0200	080	01	FU
1079	FJ4A	720	B	645414	GML	1500	EL	0030	040	01	MR
1079	FJ4B	705	C	625377	GML	1530	TO	0050	110	01	FF
1079	FJ4B	713		576406	GML	1545	EL	0100	030	UN	FF
1079	ARTA	122	B	741302	MTR	1600	EL	0050	040	02	MR *
1079	ARTA	496	B	648302	MTR	1600	EL	0005	005	02	CU
1079	ARTA	826	B	742386	MTR	1600	ED	0020	000	08	MR *
1079	C41A	383	C	512342	GML	1600	LD	0050	050	04	EA
1079	C41A	669	B	530240	GML	1630	LD	0100	080	02	EA

Page 4 of Appendix 4 to Annex D

CONFIDENTIAL

359

CONFIDENTIAL

UH-1H (cont.)

1079	GZ6B	708		595378	GHL	1640	EL	0900	090	02	FU	
1079	C3EA	169	B	515338	GNH	1645	LD	0100	050	04	NA	
1079	AB3A	491	B	561412	GML	1800	EL	0030	110	UN	FU	
1080	ARTA	210	B	648308	GHL	1100	LD	0100	060	01	OT	
1080	FJ4A	633	B	725361	GHL	1200	EL	0025	110	04	HD	
1080	FJ4A	720	B	725361	GHL	1200	EL	0025	110	04	EN	
1080	ARTA	770	B	648301	GNH	1200	EL	0800	095	01	MR	
1080	FJ4A	720	B	725361	GHL	1202	EL	0025	110	04	EN	
1080	ARTA	227	B	648301	GNH	1230	EH	1700	110	02	FU	
1080	ACFT	642		705450	GNH	1340	EO	0025	000	UN	UN	*
1080	ARTA	357	B	648303	MTR	1400	EO	0003	000	06	MR	
1080	AB3A	693	B	691387	GHL	1400	EL	0100	095	05	EA	
1080	ARTA	742	B	648301	MTR	1420	EO	0010	000	01	EN	
1080	ARTA	491	B	648303	MTR	1420	OG	0000	000	04	EN	
1080	FJGA	643	A	554344	MTR	1500	OG	0000	000	01	NA	
1080	C3GA	667	A	555345	MTR	1530	LD	0010	010	02	OT	
1080	ARTA	826		648303	MTR	1630	EO	0003	000	50	EN	
1081	ABOT	403		844200	ART	1115	OG	0000	000	02	OT	*
1081	ACFT	702	B	845380	RKT	1350	OG	0000	000	01	NA	*
1081	ACFT	460	A	970590	GHL	1510	LD	0800	090	01	EA	*
1081	C44A	759		665365	AAA	1600	EH	4500	090	UN	FF	
1081	FJ4A	597	B	665362	MTR	1600	EO	0005	000	01	MR	
1081	ABOC	555		815368	RKT	1705	OG	0000	000	05	NA	*
1081	C42A	340	A	648301	GNH	1715	EH	3500	080	02	OT	
1081	C3EA	101	A	795362	MTR	1745	OG	0000	000	01	NA	*
1081	C3EA	418	A	795362	MTR	1745	OG	0000	000	01	NA	*
1082	ABOC	316	A	854418	RKT	0240	OG	0000	000	05	NA	*
1082	C42A	676	C	790360	GNH	0900	LD	0500	090	01	TR	*
1082	AB3B	341	A	760358	GNH	0900	EH	2000	080	01	MR	*
1082	C42A	651	C	743352	GML	1130	TO	0800	090	03	TR	*
1083	FJ4C	493	B	849380	MTR	0930	HO	0003	000	01	OT	*
1083	ARTA	004	B	665535	GNH	1010	OG	0000	000	05	CT	*
1083	C3EA	704	B	725358	GNH	1030	EH	1500	090	01	OT	
1083	ARTA	122	B	673525	GNH	1230	LD	0005	002	02	CU	*
1083	FJ4C	508	B	976434	GHL	1550	OR	0300	080	01	OT	*
1083	ARTA	357		664438	GNH	1815	EL	0150	035	07	TR	*

CONFIDENTIAL

361

CONFIDENTIAL

CH-47 (cont)

1079	FJ5A	541	A	755371	GNL	1530	TO	1500	080	01	NA	*
1079	C5KT	102	A	595378	GNH	1640	EL	0900	090	02	EN	
1080	FJ5B	504	C	735365	GNH	1710	EH	2500	090	01	OT	*
1080	FJ5C	813	B	373438	GNL	1840	EH	1500	070	02	NA	
1081	FJ5C	848	B	720360	GNL	1750	EH	3500	070	01	MR	
1082	C03A	444	A	725320	GNH	1430	EL	0500	070	01	NA	
1082	C03A	438	A	725320	GNH	1500	EL	0500	070	01	NA	

CONFIDENTIAL

CONFIDENTIAL

362

CH-53

	A	B	C	D	E	F	G	H	I	J	K	L	M
1046	USMC	664	B	712280	GNL	1700	EH	2500	100	03	HD		
1047	USMC	674	B	698220	GNL	1420	LD	0200	080	02	FU		
1049	USMC	667		UNK	OTH	1700	EL	0800	UNK	UN	MR	*	
1054	USMC	953	A	698216	MTR	1820	HO	0010	000	02	OT		
1054	USMC	660		698216	MTR	1825	HO	0010	000	15	HD		
1056	USMC	657	A	698213	GNL	1355	TO	0300	070	01	EL		
1056	USMC	658	B	696216	AAA	1400	TO	2000	090	01	OT		
1063	USMC	133	B	425325	GNL	1245	EH	3000	070	01	OT		
1067	USMC	668	B	431371	MTR	1010	HO	0010	000	13	MR		
1067	USMC	663	A	398378	GNL	1200	EH	2500	040	02	MR		
1067	USMC	157	A	438372	MTR	1300	OR	0010	000	01	OT		
1070	USMC	669	A	UNK	GNH	UNK	UN	UNK	UNK	01	MR		
1070	USMC	953	B	490345	GNH	1445	OR	1700	070	04	OT		
1072	USMC	668	B	496346	GNL	1300	EH	1500	120	01	MR		

CH-54

1083	ARBA	418	B	852420	MTR	0200	OG	0000	000	NA	NA	*
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Appendix 6 (CH-53/CH-54) to Annex D (Summary of Combat Damage)

CONFIDENTIAL

CONFIDENTIAL101st Aviation Battalion (Assault Helicopter) (Airmobile)

AB3A Company A (Assault Helicopter)
AB3B Company B (Assault Helicopter)
AB3C Company C (Assault Helicopter)
AB3D Company C (Assault Helicopter)
DX6A Company D (Assault Helicopter)

158th Aviation Battalion (Assault Helicopter) (Airmobile)

FJ4A Company A (Assault Helicopter)
FJ4B Company B (Assault Helicopter)
FJ4C Company C (Assault Helicopter)
FJ4D Company D (Attack Helicopter)
AAVD Company D (Attack Helicopter) 227th Aviation Battalion

159th Aviation Battalion (Assault Support Helicopter)

FJ5A Company A (Assault Helicopter)
FJ5B Company B (Assault Helicopter)
FJ5C Company C (Assault Helicopter)
C5KA 179th Aviation Company (Assault Support Helicopter)
CO3A 132d Aviation Company (Assault Support Helicopter)
ARBA 478th Aviation Company (Heavy Helicopter)
USMC 463d Heavy Marine Helicopter, 3d Marine Amphibious Force

4th Battalion (Aerial Artillery), 77th Artillery (Airmobile)

FJ8A Battery A (Aerial Artillery)
FJ8B Battery B (Aerial Artillery)
FJ8C Battery C (Aerial Artillery)

Appendix 7 (UIC Codes and Unit Designations) to
Annex D

CONFIDENTIAL

CONFIDENTIAL

364

223d Combat Aviation Battalion

DLKA 223d Aviation Battalion
C3EA 48th Aviation Company (Assault Helicopter)
C41A 173d Aviation Company (Assault Helicopter)
DX9A 238th Aviation Company (Aerial Weapons)
FJGA 282d Aviation Company (Assault Helicopter)

14th Combat Aviation Battalion

ARTA 71st Assault Helicopter Company
C3GA 116th Assault Helicopter Company
C42A 174th Assault Helicopter Company

Air Cavalry Units

ABOT Headquarters & Headquarters Troop, 2d Squadron (Airmobile)
17th Cavalry
ABOA A Troop, 2d Squadron (Airmobile), 17th Cavalry
ABOB B Troop, 2d Squadron (Airmobile), 17th Cavalry
ABOC C Troop, 2d Squadron (Airmobile), 17th Cavalry
AZNC C Troop, 7th Squadron, 17th Cavalry
GZ6B B Troop, 7th Squadron, 17th Cavalry

Medical Units

D64A 236th Medical Company
D65A 237th Medical Company
ACFT 326th Medical Battalion
BM2A 498th Medical Company
EAEA 571st Medical Company

Other Units

AB6A 3d Brigade, 101st Airborne Division (Airmobile)
ACJA Battery A (Aviation), 377th Artillery

Page 2 of Appendix 7 to Annex D

CONFIDENTIAL

365

ANNEX E ABBREVIATIONS / ACRONYMS

ACL	-	Allowable Cargo Load
ADC (O)	-	Assistant Division Commander (Operations)
ADC (S)	-	Assistant Division Commander (Support)
AGL	-	Above Ground Level
AHB	-	Assault Helicopter Battalion
ALO	-	Air Liaison Officer
AMC	-	Air Mission Commander
AMTFC	-	Air Mission Task Force Commander
API	-	Armor Piercing, Incendiary
ARA	-	Aerial Rocket Artillery
ARP	-	Aero Rifle Platoon
ARVN	-	Army of the Republic of Vietnam
ASHB	-	Assault Support Helicopter Battalion
ASL	-	Authorized Stockage List
AWC	-	Aerial Weapons Company
BDA	-	Bomb Damage Assessment
BOC	-	Battalion Operations Center
CA	-	Combat Assault
CAB	-	Combat Aviation Battalion

ANNEX E

CAP	-	Cover and Protection
CBU	-	Cluster Bomb Unit
C&C	-	Command and Control
COMUSMACV	-	Commander, United States Military Assistance Command, Vietnam
DISCOM	-	Division Support Command
DMZ	-	Demilitarized Zone
DSSA	-	Direct Support Supply Activity
FAC	-	Forward Air Controller
FB	-	Fire Base
FDC	-	Fire Direction Center
FFAR	-	Folding Fin Aerial Rocket
FSA	-	Forward Support Area
FSE	-	Fire Support Element
FWMAF	-	Free World Military Assistance Forces
GC	-	Ground Commander
GVN	-	Government of the Republic of (South) Vietnam
HE	-	High Explosive
HEAT	-	High Explosive, Antitank
HEI	-	High Explosive, Incendiary
IFR	-	Instrument Flight Rules

367

KIA	-	Killed in Action
LNO	-	Liaison Officer
LZ	-	Landing Zone
MEDCOM	-	Medical Command
MEDEVAC	-	Medical Evacuation by Helicopter
MIA	-	Missing in Action
NDP	-	Night Defensive Postition
NORFM	-	Not Operationally Ready, Field Maintenance
NORM	-	Not Operationally Ready, Maintenance
NOROM	-	Not Operationally Ready, Organizational Maintenance
NORS	-	Not Operationally Ready, Supply
NVA	-	North Vietnamese Army
NVN	-	North Vietnam
OPCON	-	Operational Control
OR	-	Operationally Ready
PAX	-	Aircraft Passenger
PMP	-	Preventive Maintenance Periodic Inspection
PZ	-	Pickup Zone
RVN	-	Republic of Vietnam
RVNAF	-	Republic of Vietnam Armed Forces

368

SOI	-	Signal Operating Instructions
TAC air	-	Tactical Air (Air Force)
TF	-	Task Force
UHF	-	Ultra High Frequency
USAF	-	United States Air Force
USARV	-	United States Army Vietnam
VFR	-	Visual Flight Rules
VHF	-	Very High Frequency
VNMC	-	Vietnamese Marine Corps
WIA	-	Wounded in Action
WP	-	White Phosphorus
7th AF	-	Seventh US Air Force

369

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ANNEX F DEFINITIONS

AERIAL ROCKET ARTILLERY

Attack helicopters (AH-1G) armed with 2.75-inch rockets, 40mm grenade launchers, and 7.62mm miniguns, organized and employed as an integral part of field artillery (also known as aerial field artillery).

AIR STRIKE

An attack on specific objectives by fighter, bomber, or attack aircraft on an offensive mission. One strike may be delivered by several air organizations under a single command in the air.

ARMED HELICOPTERS

Those helicopters having primary weapon subsystems installed and utilized to provide direct fire support.

BASE AREA

A section of terrain which contains enemy installations, defensive fortifications, or other physical structures used for the following purposes:

- a. Basic or advanced training of personnel and units.
- b. Political, military, or logistic headquarters.
- c. Storage and distribution of supplies.
- d. A site used by combat units to rest, regroup, train, evade allied forces, and / or initiate the preparatory phase of offensive operations.

BASE AREA 604

Base Area bounded by the following grids: XD0636, XD3063, XD5543, XD5527, and XD0643.

ANNEX F

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370

BASE AREA 611

Base Area bounded by the following grids: XD5422, XD6324, XD7109, YD0004, YD2506, YD3100, YC3190, XC7890, and XD6000.

BINH TRAM

A regimental size unit of the NVA which controls the movement of men and supplies through a specific area of operations. To accomplish this mission, each Binh Tram has subordinate to it transportation, engineer, anti-aircraft, and communication-liaison battalions. In addition each Binh Tram has infantry elements to provide security. All personnel within a Binh Tram have received infantry training and are prepared to fight as infantry when required to defend the Binh Tram area of operations.

BLIVET

A collapsible container for fuel or water, varying in capacity, i. e., 50, 250, 500 gallon.

CLOSE AIR SUPPORT

Air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces.

COBRA

An AH-1G armed helicopter.

COMMAND AND CONTROL (C&C) HELICOPTER

Usually used to designate a helicopter equipped with additional radios, in which a commander positions himself over a battle area.

COMMANDO VAULT

A 15,000 pound bomb (Blu 82) with a fuze extender utilized to construct one to three-ship landing zones.

F-2

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CONFIDENTIALCONTACT OR "IN CONTACT"

Engagement with an enemy force, i.e., being fired upon and returning fire. The supported unit commander is responsible for making the "in contact" determination.

DAISY CUTTER

USAF bombs modified with an M1A1 fuze extender which insures a height of burst one to three feet above ground level. This ordnance is used in the construction of landing zones.

DIRECT AIR SUPPORT CENTER (DASC)

A subordinate operational component of a tactical air control system designed for control and direction of close air support and other tactical air support operations, normally located with the fire support coordination elements.

DUSTOFF

Designation of medical evacuation helicopters.

HAC BAO (BLACK PANTHER COMPANY)

An elite volunteer force of the 1st ARVN Inf Div numbering approximately 300 men. During LAMSON 719 the company conducted bomb damage assessment and was employed as a strike force for raid type operations.

HEAVY LIFT

For the purpose of this study, heavy lift is a term which includes medium and heavy lift helicopters (CH-47, CH-53, and CH-54)

HEAVY PINK TEAM

Reconnaissance team composed of one OH-6A, two AH-1G's, and one UH-1H command and control aircraft.

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LIGHT FIRE TEAM

Two AH-1G gunships operating as a tactical element.

PINK TEAM

Reconnaissance team composed of one OH-6A and one AH-1G.

SORTIE

An operational flight by one aircraft. One sortie is one aircraft making one takeoff and one landing on an operational flight.

WHITE TEAM

Reconnaissance team composed of two OH-6A's.

F-4

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